

CTO

THE MAGAZINE FOR INFORMATION EXECUTIVES

APRIL 1991

VOLUME FOUR NUMBER SEVEN

SEVEN DOLLARS

COVER STORY:

Banking Looks For a New Combination

Clean Air, Clean Water, Clear Consciences

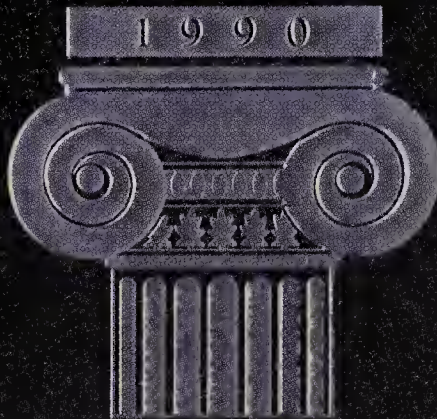
Bank South Corp.'s
Fred Cisewski

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1990



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Winner

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VAX 9000

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VAX 9000 410

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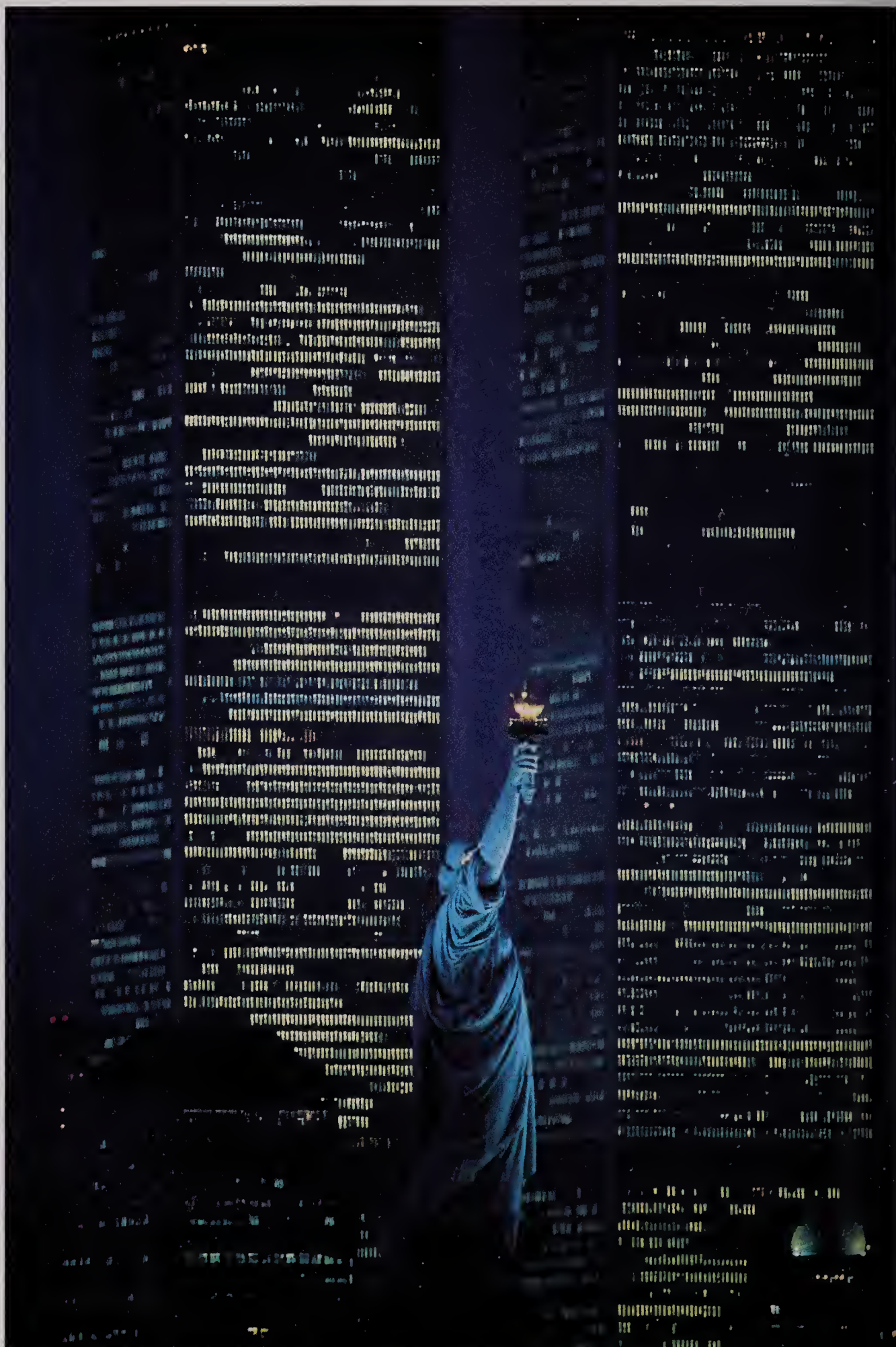
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CIO

VOLUME 4, NUMBER 7

COVER STORY

Deposits and Withdrawals

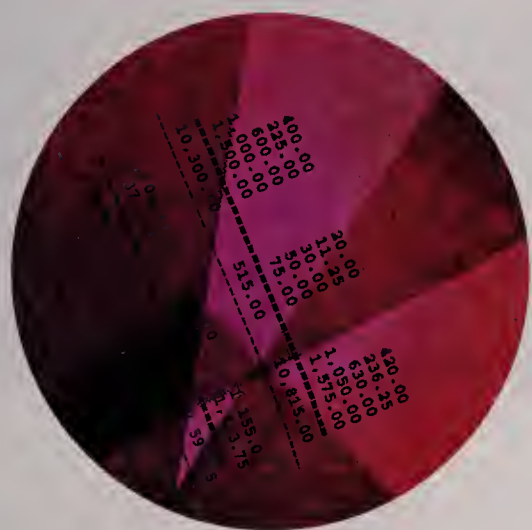
On balance, IT has made powerful contributions to banking, but the current dire climate has forced bankers to concede that technology is no substitute for sound business decisions.

By Thomas Kiely

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*A new balance for IT 42
Cover photo by Sonny Williams*



The image of efficiency 32

FEATURES

The Sharper Image

Organizations are combining imaging with other technologies and systems to solve highly focused business problems.

By Paul Konstadt

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The Greening of the Bottom Line

Businesses are beginning to realize that the free and effective flow of information is a critical factor in dealing with increasingly stringent federal standards for managing toxic substances.

By Meghan O'Leary

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To Each Its Own

Cooperative processing lets organizations with mixed hardware platforms put the computing burden where it's borne most efficiently and the information where it does the most good.

By Kathleen Melymuka

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Divide and conquer 66



M O R E ► ► ►

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COLUMNS

INSIGHTS: REFINING THE STRATEGIC PROCESS

The effectiveness of strategic planning can leave a lot to be desired. By providing relevant information on the front end and tracking results as they develop, the CIO can help align a company's plans, products and markets.

By John B. Bishop

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OUTLOOK: CIO AND SUPERCIO

The changing IS leadership role is causing a tug-of-war between the CEO's demands and the CIO's expectations. A recent survey profiles the newest IS combatants and suggests ways to end the conflict.

By Lynda M. Applegate and Joyce J. Elam

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Perfecting the plan 22

FIRST PERSON: OOPS . . . MY LUCK RAN OUT

Just when you think you're on top of the world, think again.

By Tripp Strange

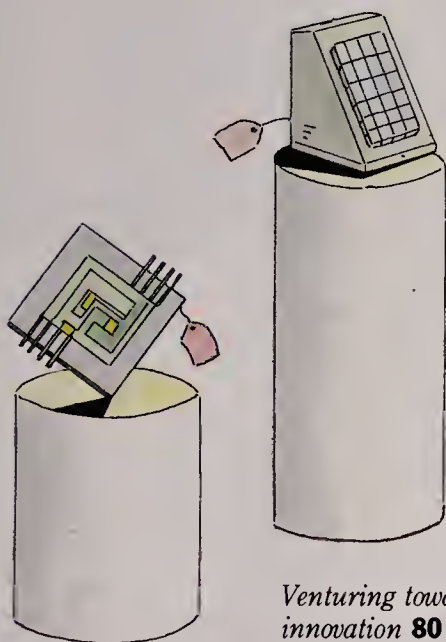
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STATE OF THE ART: NEW AGE OF VENTURE CAPITAL

When it comes to technology investment, telecommunications and software are where the money is.

By Don Gooding

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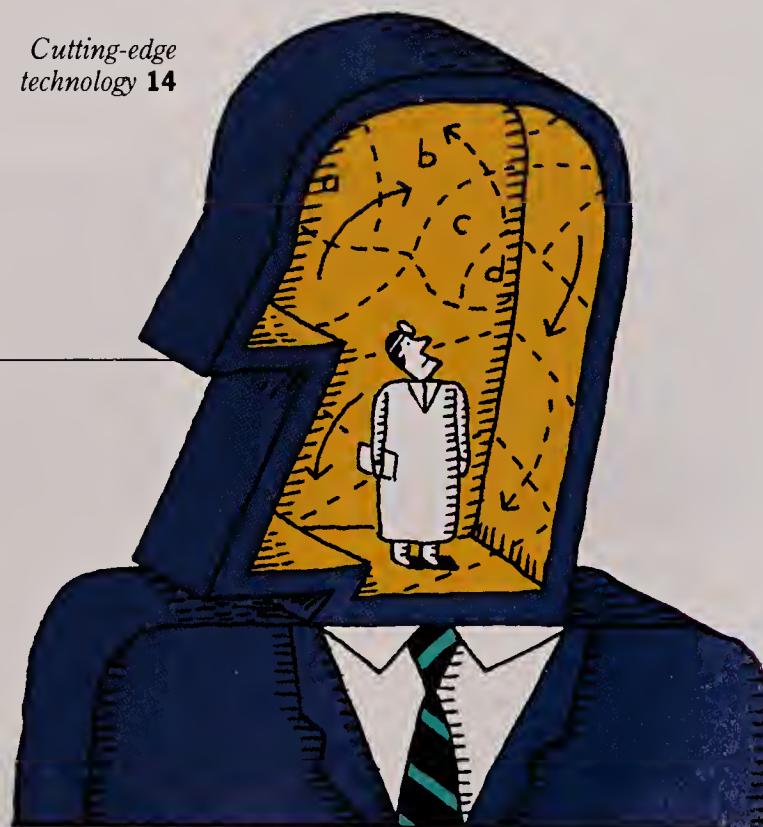
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- ▶ Diagnostic hybrid
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- ▶ Interview idiocies
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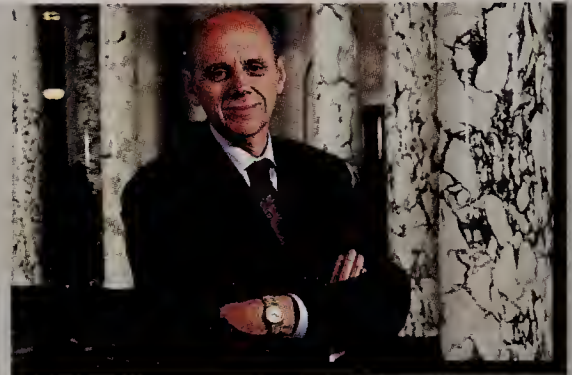
"The IEF is a superior tool for implementing Information Engineering because it integrates the entire process from planning through code generation. We're deploying the IEF throughout the corporation."

David V. Evans
Vice President
Director, Information Systems
J.C. Penney



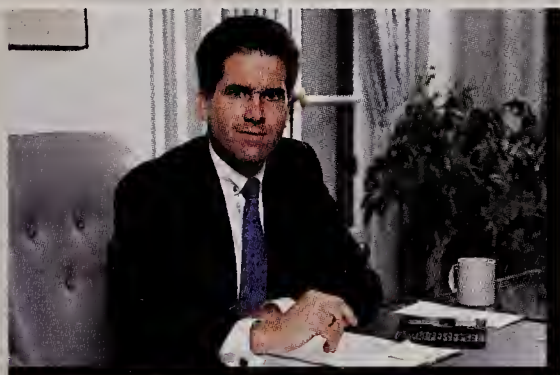
"Our On-line Banking system has been in production for more than 12 months—500,000 transactions a day—without a single code failure. And we had very few enhancements to do. Our users got what they needed the first time out."

Mark Quinlan
Senior Programmer/Analyst
Huntington National Bank



"To meet the dramatically reduced time-to-market requirements for our products, we need high-quality systems that can be changed fast. That's why we've chosen the IEF as the CASE solution for our entire organization."

John Pajak
Executive Vice President
Mass Mutual Life Insurance



"The strengths of the IEF are clear-cut. One obvious quality advantage is that application changes are made to diagrams, not code. This ensures ongoing integrity—the specification always matches the executing system."

Paul R. Hessinger
Chief Technology Officer
Computer Task Group



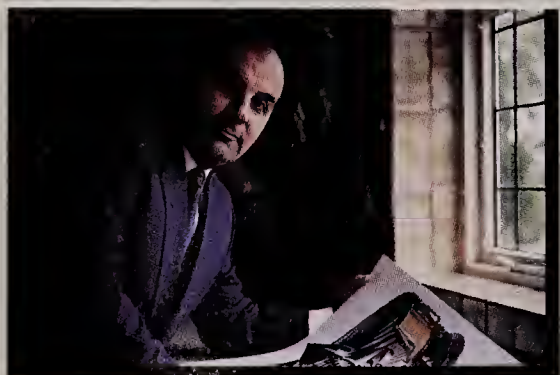
"I've seen other CASE tools fail, so I raised the bar high when we evaluated the IEF. It passed with flying colors. I could not be happier with my decision to adopt the IEF company-wide."

John F. Mott
President
AMR Travel Services



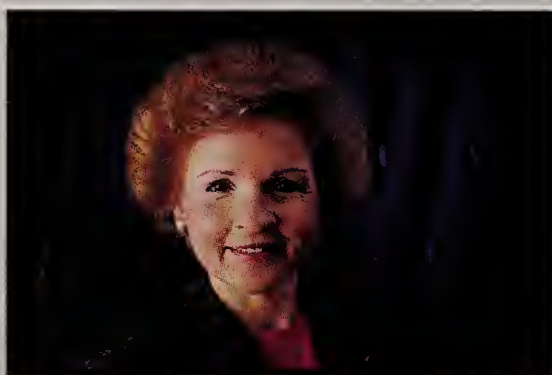
"Our users were extremely pleased when we finished our first project—a 60-transaction system—in one-half the budgeted time. We had tried interfaced CASE tools without success. IEF integration makes the difference."

Giorgio Sorani
Division Head - MIS
Lubrizol



"We are using the IEF to develop a new generation of manufacturing systems replacing over 300 existing systems. We estimate that IEF will increase our productivity by between 2-to-1 and 3-to-1 for new systems development."

Wal Budzynski
Head of Operations, Systems/Computing
Rolls-Royce



"We used the IEF to rebuild our aging Frequent Flight Bonus system. With DB2 tables of up to 52 million rows, we needed high performance. And we got it...98% of our transactions complete in less than 3 seconds."

Cloene Goldsborough
Director of Data Resource Management
TWA



"Our first IEF system was completed faster, and with fewer errors, than any system I've ever seen. If I had to go back to the old ways, I'd find another job...outside the DP world. It means that much to me."

Mogens Sorensen
Chief Consultant
Nykredit (Denmark)

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The success of Texas Instruments CASE product is proven—in the field.

Major companies have used TI's CASE product, the Information Engineering Facility™ (IEF™), for everything from rebuilding aging high-maintenance-cost systems to development of new enterprise-wide strategic systems.

Study shows zero code defects.

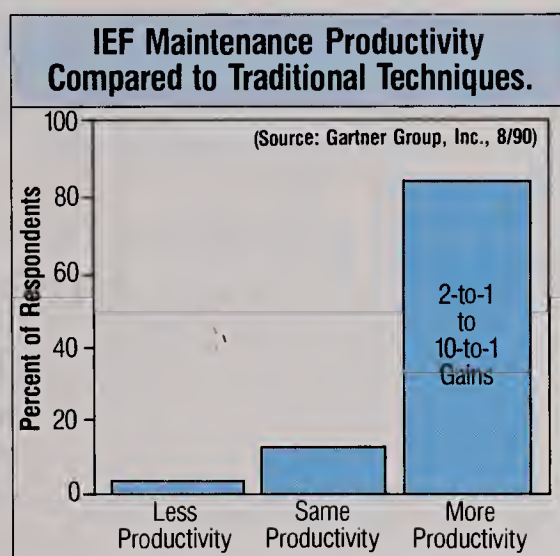
The quality of IEF-developed systems is remarkable. In recent CASE research by The Gartner Group, application developers were asked to report the number of abends they had experienced. (An "abend" is a system failure or "lock-up" caused by code defects.) IEF developers reported zero defects—not one abend had occurred in IEF-generated code.

Maintenance productivity gains of up to 10-to-1.

In this same study, developers were asked to compare IEF maintenance productivity with their former methods. Of those responding, more than 80 percent had experienced gains of from 2-to-1 to 10-to-1. (See chart.)

Specifications always match the executing application.

With the IEF, application changes are made to diagrams, not code. So, for the life of your system, specifications will always match the executing application. The Gartner Group research showed that *all* IEF users who reported making application changes made *all* changes at the diagram level.



Developers were asked to compare IEF maintenance to former methods. Of those responding, more than 80% reported productivity gains of from 2-to-1 to 10-to-1.

Mainframe applications can be developed and tested on a PC.

With our new OS/2 toolset, you can develop mainframe applications, from analysis through automatic code generation, on your PC. Then, using the IEF's TP monitor simulator and the diagram-level testing feature, you can also test these mainframe applications without ever leaving the PC.

More environmental independence coming soon—develop on PC, generate for DEC/VMS, TANDEM, UNIX.

The IEF has generated applications for IBM mainframe environments (MVS/DB2 under TSO, IMS/DC, and CICS) since early 1988. Soon you'll be able to develop systems in OS/2 and then automatically generate for other platforms. DEC/VMS, TANDEM and UNIX are scheduled for availability in 1991. More will

follow. We are committed to increased environmental independence in support of the Open Systems concept.

We are committed to standards.

IEF tools and IEF-generated code will comply with standards as they emerge. We will adhere to CUA standards and to the principles of IBM's AD/Cycle and DEC's COHESION—and we will support Open Systems environments centering around UNIX. In any environment, the COBOL, C and SQL we generate adhere closely to ANSI standards. Our presence on standards committees helps us keep abreast of ANSI and ISO developments affecting the CASE world.

Full-service support.

Of course, our technical support, consultancy, training courses, satellite seminars, and other informational assistance will continue apace. We also offer re-engineering and template services. This full-service support will remain an integral part of the IEF product.

For more information, including a VHS video demo, call 800-527-3500 or 214-575-4404.

Or write Texas Instruments, 6550 Chase Oaks Blvd., Plano, Texas 75023.

TEXAS
INSTRUMENTS



Aside from the Persian Gulf, two topics that have been grabbing news headlines continually these days are the banking industry and the environment. While we've had no reports of CIOs on the war front, this month two of our articles feature some perspective on the green scene.

Although heralded as a massive spender on information technology, the banking industry, in retrospect, may become a textbook example of a classic mismatch between the use of information and the strategic needs of a business. Of course, those needs have changed drastically during the past decade as the industry has become partially deregulated. The competitive fallout has been horrendous. The U.S. General

Accounting Office reported 1,000 bank failures during the 1980s, with about two-thirds of those failing in the last three years of the decade.

In our cover story this month, "Deposits and Withdrawals" (Page 42), Senior Writer Thomas Kiely explores how CIOs are reevaluating IT in light of the new reality of the banking industry. Many bank CIOs report their companies are paring down product offerings, building revenue with fee-based banking services and using transaction information as a basis for decision support systems that assist banking executives.

Reporting from the environmental front, Senior Writer Meghan O'Leary in her article "The Greening of the Bottom Line," beginning on Page 54, found that companies are in various stages of creating information systems used primarily to track data on the emissions of hazardous chemicals that legally have to be reported to various public agencies. This information is being shared with environmental and community groups who can use it to devise solutions to abate pollution at the local level—activities the government hasn't the resources to undertake.

Lest we get too caught up with the weightier IT issues of the day, we should not forget that *CIO* is a magazine about people. To that end, our First Person column on Page 78 is a return engagement penned by once-exalted *CIO* Tripp Strange, whose tale of a stunning reversal of fortune will prove heartrending for CIOs embroiled in the politics of positioning themselves in the corporate management firmament.

Marcia Blumenthal



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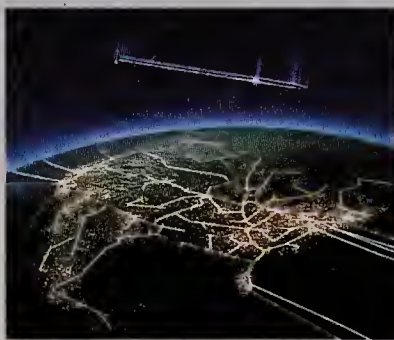
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"As we move toward the 21st century, information technologies will continue to have far-reaching effects on the conduct of business. A key impact is only beginning to receive adequate attention—the impact of these technologies in changing the shape, location and even the nature of organizations."

William G. McGowan
Chairman
MCI Communications Corp.



Networking is nothing more nor less than the ability to move information from point A to point B. Obviously this is essential for business success. But as of now few organizations are properly networked, which presents a great risk to their bottom line.

Many executives have been unpleasantly surprised to learn that they must wait until tomorrow to get a report from another part of the company because of the complexities involved in linking one set of machines to another.

The good news is that the networks designed to bridge those gaps are finally growing up. In recent years they have become more sophisticated, affordable, reliable and essential.

According to a recent *CIO* survey, 60 percent of all businesses plan to purchase networking equipment within the next year. Sales of the equipment are expected to soar to over \$23 billion by 1993.

Why the emphasis on networking? Two common business developments have fueled the networking boom: the expansion of organizations into new geographic and demographic markets and an increase in global competition where the efficient management of information is of paramount importance.

CIO Magazine is pleased to announce our Fall 1991 *CIO Perspectives Conference*—IT and The Corporate Agenda: People, Productivity and Profits. This conference is designed to help you explore the real business issues for the '90s. For detailed information on the conference, to be held Sept. 22-25 in Monterey, Calif., please call Lynda Rosenthal at 508 935-4273 or Diane Martin at 508 935-4274. They'll rush you complete information plus a registration package.

W. G. McGowan

Coming In CIO

**NEXT MONTH:
A SPECIAL REPORT
ON DISTRIBUTED
COMPUTING**

Reaping the Benefits

Distributed computing can pay off by enabling downsizing and providing lower-cost MIPS and better access to information enterprisewide, but these benefits are not guaranteed.

Options and Consequences

Many people are perplexed by the variations of distributed computing architectures (PC-to-host, client/server, peer-to-peer, cooperative processing). *CIO* takes a look at the advantages and disadvantages of each.

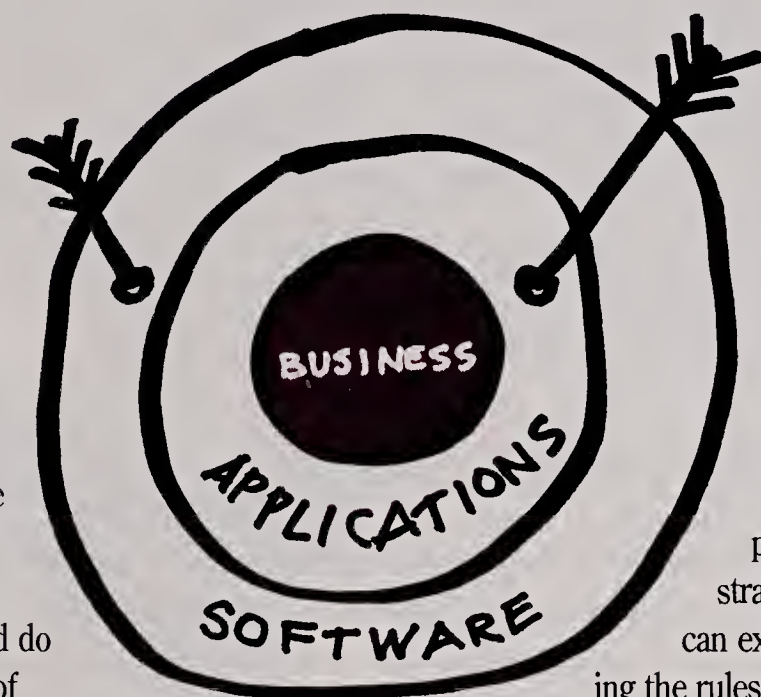
LAN Management

The local area network has rapidly evolved from a convenient resource-sharing scheme to the carrier of mission-critical applications. But for CIOs and their networking staffs, managing LANs can be one major headache.

The Wireless Network

Now that your enterprise is effectively wired, is it time to unwire it?

As long as the aim of CASE vendors is better software, they'll be off-target.



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Companies realize their full strategic potential when business can talk to MIS and vice versa. For the first time, with the new BACHMAN/Analyst™, an entire enterprise can speak a common language—rich enough for non-technicians to understand, precise enough to create software that works well.

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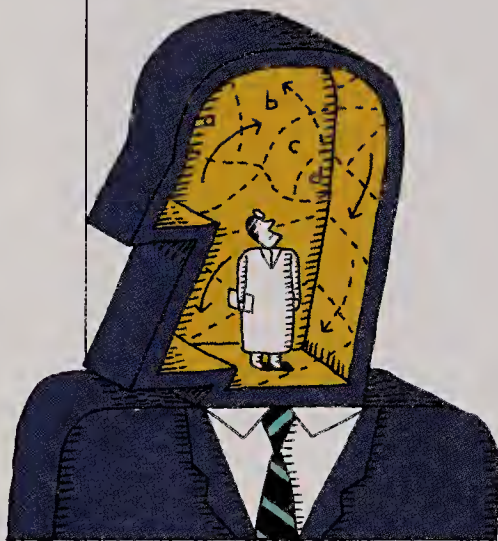


TRENDLINES

MEDICINE

SIMULATING SURGERY

Computers have long been used by the likes of pilots, drivers and engineers to simulate the real thing. Now surgeons are getting into the act with the help of new software that enables them to practice on their patients before picking up a scalpel.



While doctors have used computer simulation in the past, previous systems were often very complex to operate and prohibitively expensive. According to a recent *New York Times* article, a new generation of easy-to-use, inexpensive desktop simulation programs are now being used by reconstructive surgeons to rehearse complicated head operations. These programs create 3-D images of a patient's skull by horizontally slicing and stacking together dozens of two-dimensional magnetic resonance or CAT scan images. The 3-D images can be color-coded or shaded to provide detail. Doctors can then explore the skull by manipulating these images with either commands or a joystick.

Not only are doctors able to pinpoint the problem and test the feasibility of a variety of procedures through trial and error, but they can also accu-

rately measure defects and construct the models of bone or synthetic materials needed to repair them. Consequently much of the guesswork and improvisation inherent to head surgery is eliminated before a patient enters the operating room.

One such program was used recently by plastic surgeons at the Montefiore Medical Center in New York

to both diagnose an infant's skull deformity and plan the treatment. Developed by a division of the MediCAD Corp. of Setauket, N.Y., the program enabled doctors to look into the skull, identify the deformity, determine the best surgical procedure with which to treat it and accurately measure the dimensions of the affected area. Using a normal portion of the skull that was symmetrical to the deformed portion, surgeons were able to make a template with the precise curvature needed to repair the skull. The operation proceeded the following day without a hitch. ■

AN EYE ON THE EAST

A new publication, the *Japan Technology Monitor*, offers U.S. executives a concise roundup of business and technical developments in Japan. It abstracts articles from dozens of Japanese publications on a variety of high-tech industries. A recent 19-page issue included sections on microdevices, software, computers, telecommunications and business.

While the abstracts are very brief (with an average of six to a page), they are also quite meaty.

In addition, the *JTM* offers a Custom Monitor service (\$300 for three months), which provides subscribers with a bi-weekly list of articles on individually selected topics and translates those of interest.

An annual subscription costs \$179 in the United States and Canada, \$249 overseas. For more information, call 800 235-1339. ■

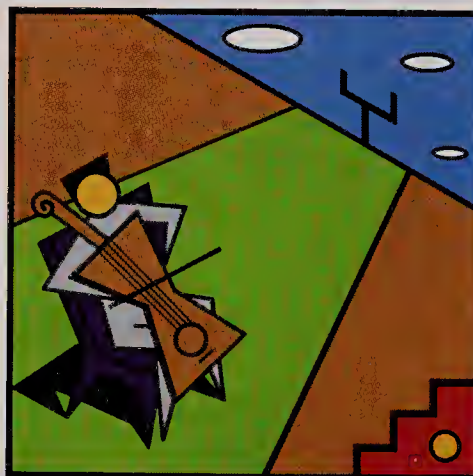
CHANGES OF VENUE

If you missed Ella Fitzgerald at the Opera House, perhaps Yamaha can make it up to you with sound-field processing, a technology that turns space and sound into values that can be programmed onto a chip, allowing a listener to hear Ella in the Opera House, Yankee Stadium or CBGB. Yamaha's remote-controlled Digital Sound-Field Processor (DSP-A700) creates, through the use of eight speakers, artificial acoustic space in a listener's living room, replicating

the differing resonances of venues such as concert halls, discos and movie theaters. Sony and Onkyo have followed Yamaha's lead with home units, while

Technics, Pioneer and Yamaha have introduced similar systems for cars.

These systems are part of a larger audio trend, in movies as well as music, toward manipulating sound to create depth and dimension—to put the listener in the middle of the action rather than outside of it. ■



DONATIONS WANTED

Computers are among the new tools now required in a fledgling free society. International Data Group (IDG, the corporate parent of *CIO*) has established the East-West Education Development Foundation to encourage use of computers in the education systems of the hard-pressed economies of Eastern Europe (Poland, Czechoslovakia, Hungary, Romania) and the Soviet Union. IDG founder and Chairman Patrick J. McGovern sees the foundation's goal as nurturing institutions that "are the seedbed of future entrepreneurs," who will in turn help their countries "complete the evolution to free market-based economies."

The foundation is calling for corporate donations of older or excess-inventory computer hardware, software and peripherals. Potential donors can reach the East-West Education Development Foundation at 617 542-1234. ■

TRENDLINES

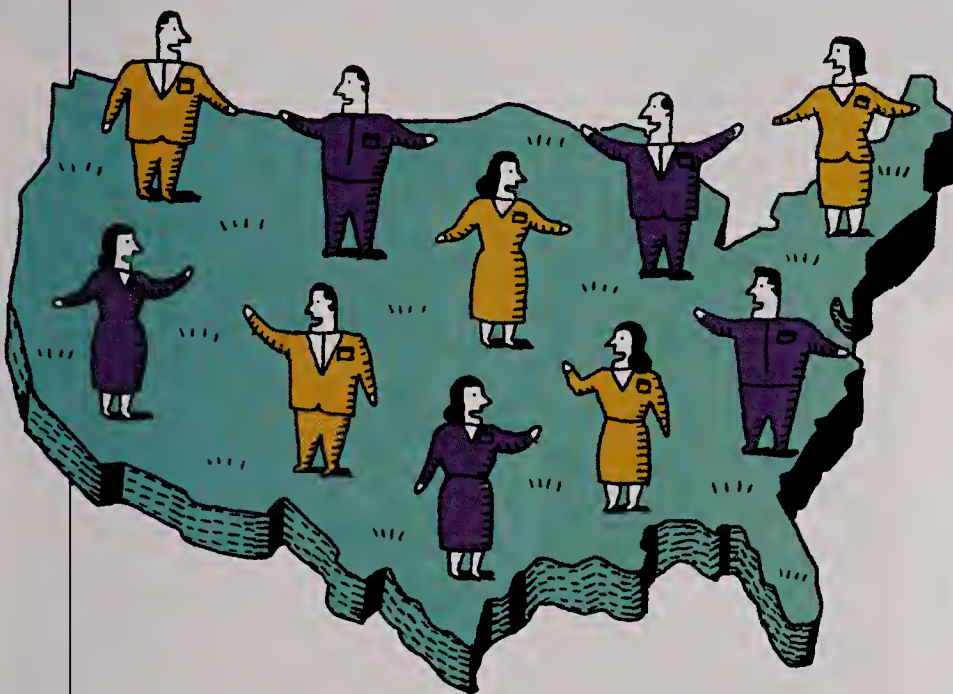
SOFTWARE SUPPORT

THROUGH THE GRAPEVINE

Doing something new with database programming? Wondering about your career path? Developed any tried-and-true training resources? Read any good books lately? Inquiring soft-

ware support professionals want to know.

Since January, The Software Support Conference has been giving support practitioners as well as support-oriented vendors and consultants



NEW VENTURES

Kelly Services Inc. and ComTrain Inc. have announced the creation of Mentrix Corp., a joint venture to produce employee testing products for the permanent workforce. Mentrix is currently shipping "The Judd Tests," a series of performance testing modules designed to evaluate job applicants' and current employees' proficiency in the use of certain types of software, including Lotus and WordPerfect.

CASE Research Corp. of Bellevue, Wash., has been absorbed by New York consultant Ernst & Young. CASE Research founders Vaughan Merlyn and Greg Boone will operate out of both Ernst & Young's Center for Information Technology and Strategy in Boston and the firm's Methodology Development Center in Dallas.

A group of leading IS directors has formed the first organization aimed at accelerating development of applications for PC-based LANs and WANs. The Network Applications Consortium comprises more than 30 charter members representing 23 corporate and government user organizations. ■

the chance to log on and sound off about everything from standards to training to career strategies. Initiated by industry consultant Mikael Blaisdell, the Conference is offered on the Whole Earth 'Lectronic Link (The WELL), a for-profit timesharing system based in Sausalito, Calif.

"I've been to conferences where the real value wasn't in the presentations, but from standing around the bar talking about who's doing what and who's really good and who's really bad," said Blaisdell, who acts as host. "I hope this [online discussion] may have some of the same influence."

The most contentious topic currently under discussion is free versus fee-based support. "Everyone has their own distinct opinion, and this is a good place for them to put their two cents in," said Pat Sullivan, support services manager for Sitka Corp., a networking company in Alameda, Calif. "When you're dealing with a flood of information like you do in this business, a generalized support mechanism like the Conference can be very valuable," he said.

Blaisdell also scans other WELL conferences for technical support topics and links the two. For example, in a Unix conference he came across a Colorado consultant's horrific tale of a company that ended up paying \$7,000 in consulting fees on a \$2,500 database system because of poor support. "Of course there have to be guidelines for things like that," said Blaisdell. "The presentation has to be factual. The aim of the Conference is to give support managers ammunition so they can give better service, not to beat them up."

The Software Support Conference may be accessed directly or through the CompuServe network at 1200/2400 baud. For further information call The WELL at 415 332-4335. ■

THE BEST-LAID PLANS

With all the time and effort that go into creating minutely detailed computer models of corporate networking needs, why is capacity planning still such an imprecise art? According to a recent report from Temple, Barker & Sloane/Strategic Planning Associates in Lexington, Mass., the problem lies in the very complexity of the models themselves. Their level of detail (many calculate each transaction's capacity requirements to two or three decimal points) creates the illusion of accuracy without validating the underlying data.

"The workload estimates that form the models' underlying assumptions are at best suspect and at worst completely unreliable," said Daniel W. Jinks, a senior TBS associate. According to Jinks, such inaccuracies can be magnified by as much as 40 or 50 percent when the workload estimates are translated into estimates of computer transactions. "The key to better capacity forecasts therefore lies not in fine-tuning the model, as many planners believe, but rather in fine-tuning the workload estimates." ■



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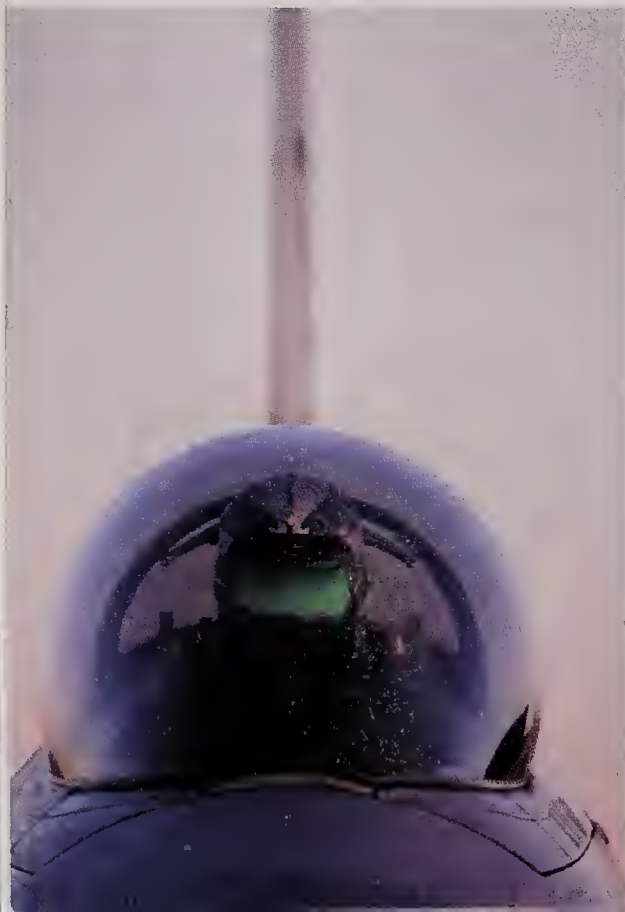
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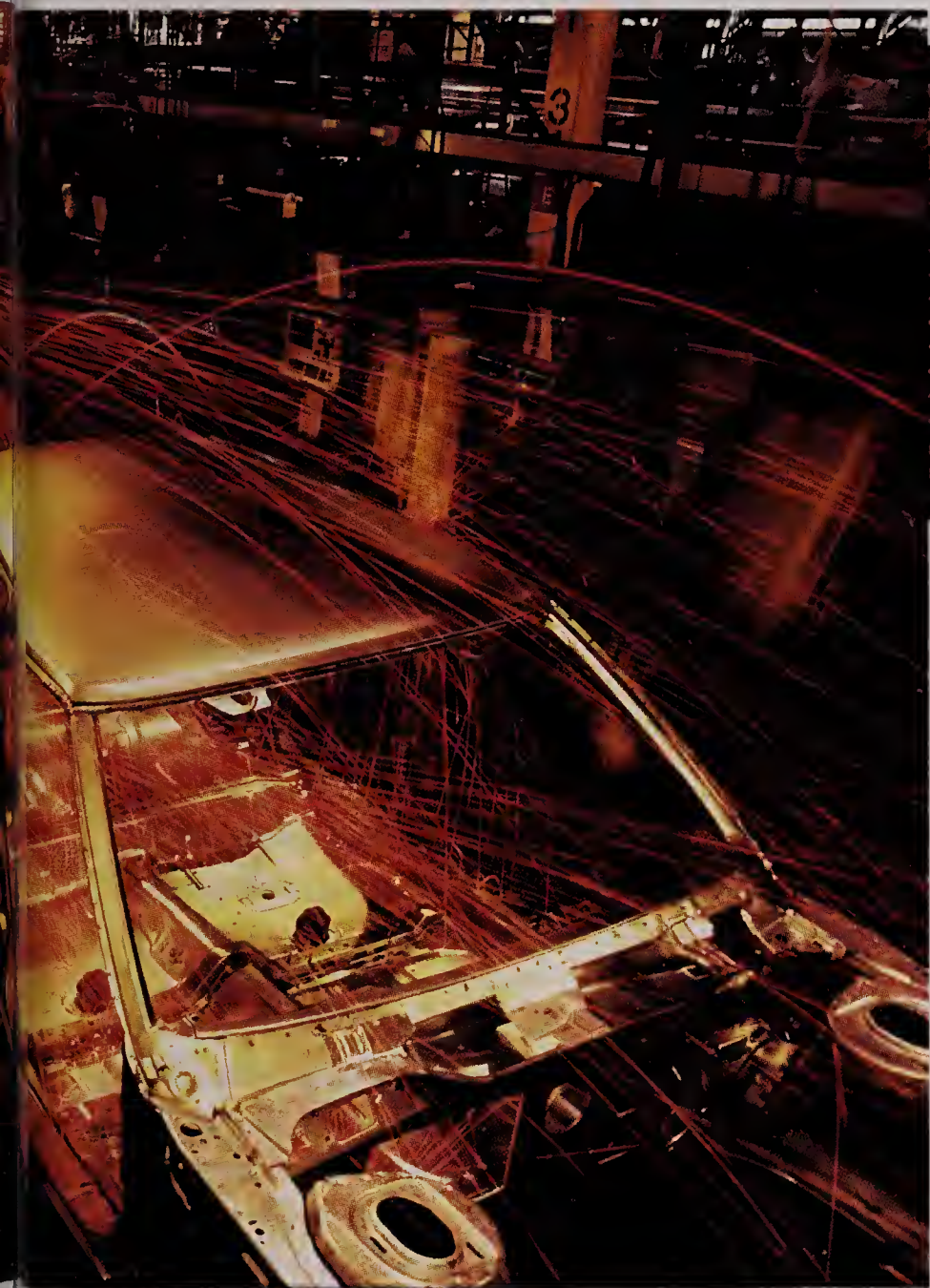
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TRENDLINES

JOB TITLES

DON'T CALL ME CHIEF!

Michael Simmons, executive vice president at the Bank of Boston, will acknowledge that he is the bank's CIO—but he doesn't like the title, and neither do a number of other banking IS managers. (See "Deposits and Withdrawals," Page 42.)

Bank CIOs find the title confining. As Walter Leonard, executive vice president at First Wachovia Corp. in Winston-Salem, N.C., explained it: "The title would tend to limit my perspective . . . if I saw myself as a CIO. I see myself as a part of the management team of the whole company, and not just focused on information services."

Worse, in the banking industry, "CIO" is considered an arrogant title, said Colin Crook, chairman of the technology committee at New York-based Citicorp. "It's

very hard to say that you manage information in the bank," Crook explained. "Information is managed by the operations. It's absolutely intrinsic to the businesses. So if you say you are the chief information officer and someone else is managing global cash management—what do you

think [he or she] is doing? You can't say you're managing their information—they're doing it."

Robert N. Gilmore, executive vice president at Core-States Financial Corp. of Philadelphia, agrees with Crook. Gilmore rose through the IS side of the bank and now holds a position where more groups than just IS report to him, so the title wouldn't fit anyway. But Gilmore added that "even when I was just a technology officer, I didn't particularly like [the title of CIO]. Information is not something that I feel is property to the guy who runs technology. It belongs to the corporation, and everybody [in the bank] is an information officer." ■



BUT IF YOU DO LEAVE HOME, CALL AHEAD

Hyatt Hotels Corp. is offering members of its frequent-guest program the option of checking in by telephone before arriving at the hotel. By calling 1-800-CHECK-IN, Hyatt Gold Passport holders can not only spare themselves the ordeal of standing in a line with other people, they can specify a certain kind of room (no smoking, corner or deluxe accommodations) and assure its availability, even for late arrival. Requests to use upgrade certificates or for special amenities can also be made through 1-800-CHECK-IN. Upon arrival at the hotel, all that remains is for the guest to stop by a special check-in desk, present a credit card, sign a completed registration form and pick up the key.

The service was inaugurated late last year based on Hyatt research in which business travelers cited the check-in process as one of the major hassles of business travel. There is no fee for joining the Gold Passport program. ■

DON'T LEAVE HOME—EVER

Arthur D. Little Inc., a Cambridge, Mass.-based research and consulting firm, is touting what might be called "virtual travel" as the cure for a variety of ills, chief among them "overburdened transportation systems"—highways and related infrastructure facilities.

The increased use of telecommunications as a travel alternative would also have far-ranging consequences for such problems as pollution and diminished productivity. According to the ADL report ("Can Telecommunications Solve America's Transportation Problems?"), a 10 to 20 percent substitution of

telecom for travel activities could yield annual benefits of as much as \$23 billion.

In addition to reduced demand on the nation's highways and byways, the study of ADL clients projected an estimated reduction of 1.8 million tons of pollutants, 3.5 billion gallons of gasoline and 3.1 billion hours of time that people could apply either to added productivity or to leisure. The report concentrated on four travel-substitution areas: working at home, shopping at home, videoconferencing and electronic data transport (reducing the need to transport paper). ■

A CALL FOR PAPERS

The Association for Information and Image Management is asking for papers for its 1992 conference, to be held in Anaheim, Calif., June 22 to 25. Of particular interest are papers addressing information and image management applications, case studies, enabling technologies or methodologies.

Interested speakers must submit a completed Abstract Submission Kit by June 7, 1991. To request a kit, send name, title, name of organization, address and phone and fax numbers to AIIM's Education Department via fax at 301 587-2711, or call 301 587-8202. ■

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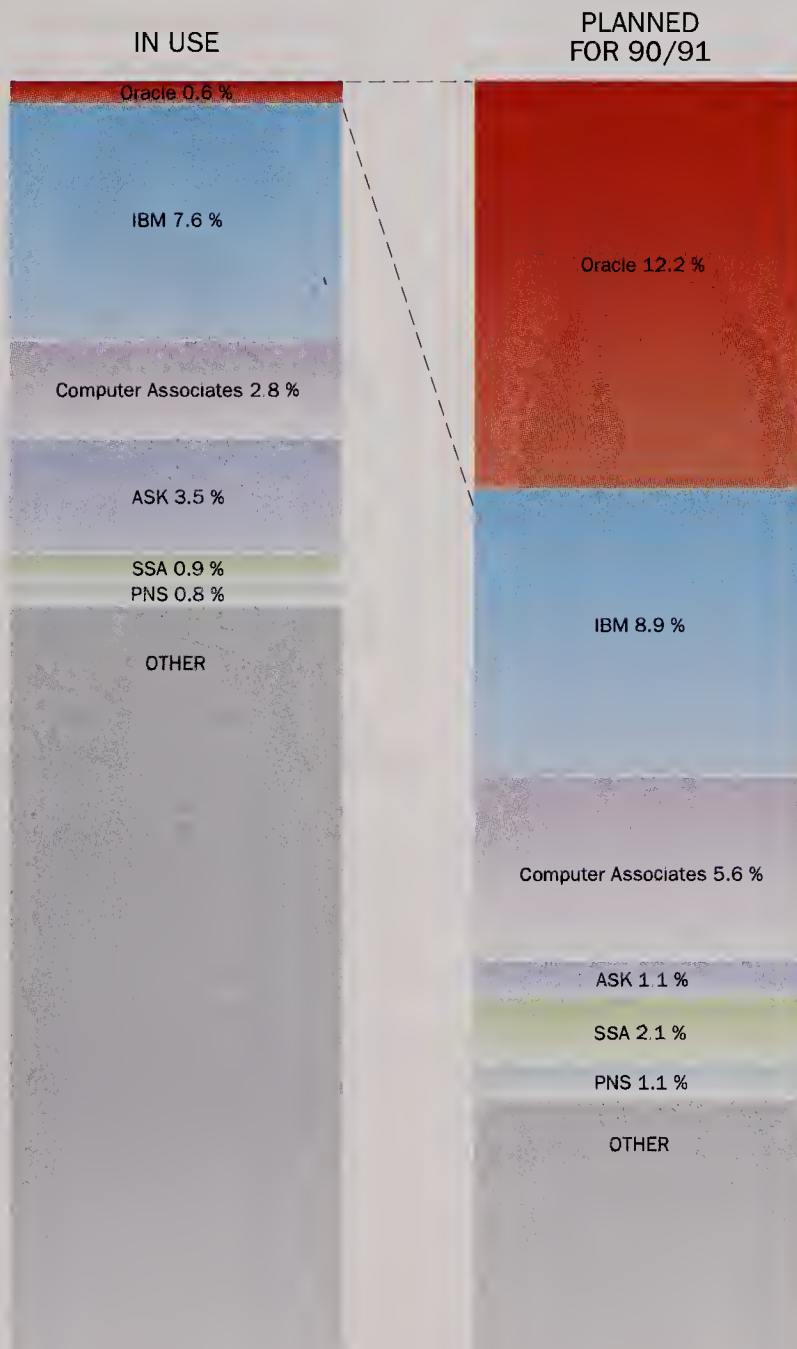
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TRENDLINES

RESEARCH

LEADING-EDGE DIAGNOSTICS

If a car could tell its owner when it needed service or was about to break down, a driver could save hundreds or thousands of dollars a year. A building wired with a security system that could recognize and diagnose a potential electrical problem would be less vulnerable to burglars. These examples illustrate the theory behind the Carnegie Group's plan to link neural networks and knowledge-based diagnostic system technologies in a single software technology.

Neural networks are able to recognize patterns and learn from experience. Knowledge-based systems can use knowledge gleaned from experts to provide explanations, make diagnoses and perform sequential actions. The work proposed by the Carnegie Group, a software firm based in Pittsburgh, will investigate a hybrid system where neural networks would perform an initial diagnosis on a machine or system via signal recognition of changes in acoustics, vibrations, temperature and electrical patterns. A linked knowledge-based system would then perform follow-up

tests leading to a specific diagnosis and repair strategy. The hybrid technology would be used to build software systems that do not require human operators for use in hazardous tasks, and for situations where signal data and expert knowledge must be used together for a definitive diagnosis and repair procedure.

According to Dennis Yablonsky, president and CEO of the Carnegie Group, such hybrid systems would have a wide range of diagnostic uses. They could be used for security—detecting developing component failures in such complex machinery as defense-deployed radar systems before they actually fail. The systems could also be used to detect potential problems on the factory floor in discrete and process manufacturing, lowering the costs associated with repair and downtime.

The work, which is being supported by a \$225,000 grant from the National Science Foundation, is the second phase of research begun in April 1989. The NSF funded the first phase of the study as well. ■

CAREER MOVES

In case you missed it . . . Allan Ditchfield, MCI Communications Corp.'s pioneering IS chief, has moved to the top IS post at Progressive Corp., a fast-growing Mayfield Heights, Ohio, insurance company specializing in covering high-risk drivers (see "Risky Business," *CIO*, March 1990).

Ditchfield presided over the increasingly strategic role of IS at MCI during a period of intense growth. "Five years ago, we might have had a dozen products," he said for the 1989 *CIO*-100; "now we have 195."

Progressive is scarcely less IS-reliant than MCI, having used technology with great success to manipulate a highly challenging niche market. ■

SPECIAL BAT CONTEST

The following press release arrived in the mail: "[Company name deleted] recently delivered a machine vision system which verifies the installation of a thrust and a batwing washer on either side of a gear. The system is able to verify both the order of assembly and the orientation of the batwing wash-

ers. Inspection time does not exceed 1.5 seconds."

This, of course, makes a weird kind of sense, and we are convinced it represents an innovation of some sort. If someone can shed further light upon the exact nature of the innovation, we are prepared to honor the best explanation with a genuine *CIO* coffee mug and publication in a future issue. In case of a tie, the decision of the judges is final.

Send entries to: Bat Contest, c/o *CIO*, 492 Old Connecticut Path, P.O. Box 9208, Framingham, Mass. 01701.

Go ahead. Drive us batty. ■



STUPID JOB-APPLICANT TRICKS

While the typical job interview is a tense and formal affair, on occasion it can seem like an audition for "America's Funniest People" or an excursion into the bizarre, misguided and desperate.

The Menlo Park, Calif., temporary service Accountemps asked more than 200 executives to recount the most unusual thing they had witnessed or heard of happening during a job interview. Respondents de-

scribed everything from a woman who tried to sell the interviewer cosmetics to a man who displayed a tattoo of his girlfriend's name to prove his loyalty.

Candidates have tried bribery (one man offered his interviewer free ballroom dancing lessons and started demonstrating) and threats (an applicant indicated that if he

wasn't hired, the company's future would be jeopardized for "confidential reasons"). One man showed up late because he locked his clothes in his closet. One left dry cleaning tags on his clothes as a testament to his hygiene. Another brought in his five children and a cat.

Then there was the woman who arrived for her interview with a snake around her neck. She should have saved that ploy for the salary negotiations. ■

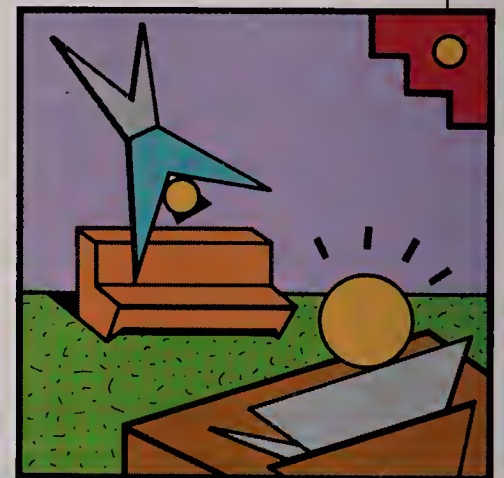


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INTEGRAL™

Refining the Process

The effectiveness of strategic planning can leave a lot to be desired. By providing relevant information on the front end and tracking results as they develop, the CIO can help align a company's plans, products and markets.

BY JOHN B. BISHOP

The single most vaunted, highly touted management innovation of the last quarter century has been the use of strategic planning to ensure congruence among a company's plans, products and markets. Two of the most common reasons that strategic plans fail to yield expected results are a lack of meaningful, timely information during the planning process, and the inability of information systems to track results across new dimensions as plans are developed and executed.

In the rush to attain the planning answer, strategic decisions are too often made based on "information available." The early involvement of IS managers could strengthen decision-making by making available more detailed, complete information. Similarly, the company's information-

gathering infrastructure is often unable to track performance data along the new parameters that are necessary to measure the effectiveness of revised strategies.

The solution to both these problems lies in a more proactive role for the CIO and the IS organization in strategic planning. It requires that the IS staff understands both the process of strategic planning and how to stake out its own role in strategy planning and execution.

Essentially, strategic planning is a more holistic way of looking at a company's markets and the internal and external factors that influence future success and growth. IS plays a critical support role in such analysis by providing internal information and facilitating the comparison of company operating data with market and competitive trends.

Strategic planning in its most basic form attempts to answer three questions: What and where are the most attractive potential markets in terms of growth and profitability? What is the company's relative current position in those markets? What must be done to take advantage of the most profitable growth opportunities?

Answering the first question requires analyzing external information about industry trends. The answer to the second will be based heavily on internal performance detail and competitor analysis. It frequently requires realignment of internal operations data in order to compare a company's market, financial and operating performance along market segment dimensions to that of competitors and the needs/expectations of specific customer groups. Determining the third involves the analysis of potential actions and the incremental cost of marketing and operating changes. This more efficiently focuses resources on the needs and



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expectations of customer groups in order to gain competitive advantage.

The CIO interested in strategic planning must be aware of the information-related problems involved. The grouping of customers into market segments for strategic analysis may differ markedly from the way a company reports operating performance information. Market information, therefore, is collected and arrayed along market segment definitions that may be quite different from the way company divisions track profit, sales, expense and related operating data.

For strategic analysis, this segmentation structure should be based on the criteria that influence customers' buying decisions. This will often require combining information about customers differently than if it were to be used for operating performance tracking. For example, information systems readily tell us what products

Prompt and adequate tracking information can help a company avoid wasting its resources and jeopardizing its market performance.

of a particular division were sold and at what volume and price. The strategic questions to be answered are, "Which customers bought them and what characteristics do they have in common?" and "What is unique about this group of customers and the way they buy from us?"

The likely mismatch of market and business information is instantly obvious when answering the question: Where is our performance relative to the market segment size, growth and profitability?

At this point it is of limited strategic value to know that Division A sold \$64 million of X and Y products unless those sales can be related to

market share in the specific segments into which they were sold.

Lack of effective CIO support can result in haphazard decisions about market priorities based on questionable information, or a costly and time-consuming manual retabulation of market and operating data.

There are a number of steps the CIO can take to strengthen his or her role in the planning process. First, IS managers must be designated to work with those who manage the planning process to ensure that they understand the information and information processing requirements. This is true whether the company has a formal annual planning cycle or is undertaking strategic planning on a task-force basis.

IS people lend credibility to the methodology and results of the process and can recommend cost-effective alternatives for obtaining data. They can ensure that planning schedules realistically reflect the time and resources required to produce planning information or, at a minimum, that the risks of compressed schedules are understood.

IS staff can also help set specifications for the analysis formats when strategic planning teams or task forces are designated. Strategic planning information requirements can differ significantly from the usual formats for collecting, tracking and reporting business unit performance data.

IS team members must identify not only what information is required but in what "cuts" (by size of customer, system configuration, geographic location, etc.) it is most usefully delivered. They can suggest alternate ways of obtaining available information and relating it to the strategic questions under consideration. Their contribution in terms of reducing the need for costly manual tabulation exercises can be substantial.

As part of the senior team, the CIO should make clear the value to be gained from IS's full involvement. When consultants are participating, they know well the risks of inadequate information management support for such studies. Regrettably, some will take shortcuts or settle for

rough estimates when data is unavailable in scheduled time frames. Many CIOs recognize their responsibility for the completeness, accuracy and integrity of information used by their companies and can leverage this role to position their people in the planning effort. This posture is enhanced when the CIO shares fiduciary accountability with a CFO.

Strategic planning efforts frequently result in new organizational structures and different ways of measuring corporate and business unit performance according to new market segments. Lengthy time lags between the implementation of a new strategy and the availability of results can be costly in terms of corporate resources and market effectiveness. The CIO can take a lead role in identifying the time and resources necessary to produce the desired results of a new strategy as well as in providing information on its effectiveness.

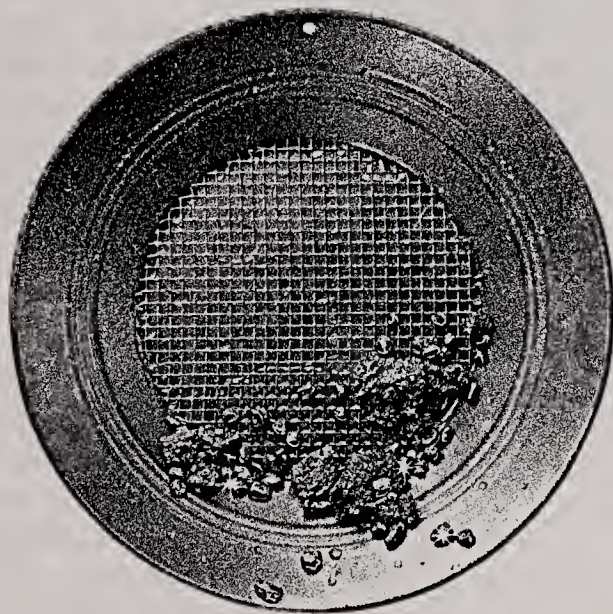
Even strategies with a high likelihood of success can fail. Prompt and adequate tracking information can help a company avoid wasting its resources and jeopardizing its market performance. As new target markets emerge during the planning process and as operations benchmarks used by successful competitors become clear, the IS staff begins to formulate measurement and tracking systems to report success in critical areas of the strategies.

Finally, the IS organization must thoroughly understand the objectives and planning process techniques being used. The most successful planning efforts generally include a complete orientation of both the central planning team (usually marketing or corporate planning directed) and representatives from such critical support organizations as IS and finance.

While strategic planning is not new to American business, the effectiveness of its use leaves much to be desired. One critical step to increase that effectiveness is to better prepare and involve the corporate groups that contribute vital skills and information. ☐

John B. Bishop is president of J.B. Bishop Associates in Essex Fells, N.J., a firm specializing in business- and market-strategy consulting.

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CIO and SuperCIO

The changing IS leadership role is causing a tug-of-war between CEOs' demands and CIOs' expectations. A recent survey profiles the newest IS combatants and suggests ways to end the conflict.

BY LYNDA M. APPLEGATE AND
JOYCE J. ELAM

Faced with the growing strategic importance and pervasiveness of information technology, senior executives have been forced to rethink the role of IT and of the information systems leaders in their organizations. When IT served strictly a support function, an IS leader could perform adequately with a modicum of technical expertise and management competence. No longer. The past decade has hoisted onto the shoulders of the IS leader a new and expanded set of responsibilities that demands strong leadership skills, power and business expertise.

To better understand these changing requirements and how they are influencing the nature of roles and responsibilities, the authors conducted a study of 64 IS leaders who assumed their positions between January 1986 and January 1989. To gain a richer understanding of the challenges faced by new IS leaders and the strategies they were developing to deal with these challenges, in-depth interviews were conducted with new IS leaders and CEOs.

Who are these new IS leaders?

Finding the ideal manager to lead an organization in the midst of change is difficult. Word on the street and in the popular press is that most companies are replacing traditional IS managers who have strong technical backgrounds with senior business executives. And in an attempt to shake up an entrenched organization, many are

hiring from the outside rather than promoting an internal candidate.

But this is not exactly what we heard from CEOs. They said they would prefer an IS leader with both strong business and technical backgrounds, but expected that such individuals would be hard to find. Although most senior executives were looking outside the firm, many said they would prefer a highly qualified internal candidate who understood the business and had the working relationships necessary to get the job done.

Our survey bears out the interviews. Clearly a strong business background is important: Seventy percent of the new IS leaders had five or more years of general management experience. Surprisingly, 37 percent had both strong business and technical backgrounds. Only 30 percent rose to the top leadership position through the traditional IS function.

A slight majority of the new leaders were internal hires, suggesting that companies looking to external candidates might be finding the search disappointing. A higher percentage of external hires followed the firing or demotion of a predecessor and the creation of a new position.

Interestingly, in a similar survey conducted by the authors, 94 percent of IS leaders who had been in their positions five years or more were internal hires. Approximately 60 percent had risen through IS and possessed strong technical experience but no general business experience, and only 12 percent had both.

Power is an essential ingredient

A leader cannot lead without power, but this power can only be realized by the development and communication of a vision that is highly valued by others in the organization, and by the empowerment of others to initiate the actions needed to achieve



ILLUSTRATION BY CHRIS GALL

that vision. An effective leader, therefore, must develop and communicate an agenda for action and develop effective internal and external networks for carrying it out.

Our data suggests that our respondents' top priority was the development of an "information" or "information technology" infrastructure for the company. This minor difference in terminology reflected a major difference in approach. New leaders who had risen through the IS organization often used the term "information technology" and stressed the technical standards and policies needed to support business process integration throughout the organization. In contrast, those with strong business backgrounds often used the term "information" and stressed the need for shared information to support both business process integration and shared management decision-making, planning and control.

Many linked their information architecture initiatives to corporatewide organizational change initiatives. One company that had recently consolidated its three strategic business units into one global organization saw IT as a critical enabler of successful integration of the reorganized firm and, paradoxically, as a major impediment to reorganization since each of the previously independent business units had developed widely diverse business and management systems. Three of the new IS leaders mentioned the critical role the IS organization would play in corporatewide business process integration, redesign, downsizing and delayering.

Human resource management and IT planning and control tied for second place as major initiatives. Cross-training of business and technology professionals to develop the hybrids of the future was the most common focus of the human resource management agenda. A number of IS leaders were developing programs for rotating IS professionals through business positions, and some were also developing programs for rotating business professionals through IT.

The third highest priority was the linkage of IT and business planning processes: the need to take a proactive stance in looking for ways that IT can drive as well as support strategy.

The importance of networking

When asked how they planned to accomplish their agendas, many of our respondents stressed the importance of sharing information with others inside and outside of the corporation, including corporate senior management, business unit executives and

other influential managers, and IS managers under their direct control. Frequently mentioned external network categories included vendors, IS leaders in other companies, academics and consultants. Most of the respondents' time was spent in internal networking activities.

But successful networking requires power and status within an organization. A sense of the formal organizational power inherent in the IS leadership position can be inferred from reporting relationships, membership on the senior management strategic policy committee and salary.

As similar studies have shown, the percentage of IS leaders reporting to the CEO is on the rise. In our sample, 27 percent of the respondents reported directly to the CEO, while only 13 percent of their predecessors did so. In addition, nearly half of our sample were members of the senior executive policy and strategy committee. But only 29 percent of internal hires were members of this group while 63 percent of external hires were members.

The growing importance of the senior IS leader is also reflected in compensation level. Seventy-five percent of our sample received more than \$150,000 per year in base salary; 22 percent received between \$100,000 and \$150,000 and only two individuals received less than \$100,000.

Although new IS leaders are being repositioned and compensated commensurate with the strategic importance of IT, many CEOs continue to evaluate them using traditional cost-effectiveness measures. Lack of clarity on the evolving role of the IS function and, more critically, reliance on inappropriate measures for evaluating the performance of the function and its leaders contribute to a lack of stability in the IS leadership role.

Our study showed a 58 percent turnover rate among top management IS professionals during the 1980s. Thirty-five percent of the predecessors of the new IS leaders were demoted or dismissed, confirming dissatisfaction with and lack of confidence in IS leadership. Almost 25 percent of our respondents' predecessors left voluntarily, suggesting that dissatisfaction on the part of IS leaders may also be contributing to high turnover.

AMONG THE FINDINGS

53%

of new IS leaders were internal hires

94%

of established IS leaders were internal hires

70%

of new IS leaders came from a business or hybrid background

41%

of established IS leaders came from a business or hybrid background

75%

of new IS leaders earn more than \$150,000 annually

3%

of new IS leaders earn less than \$150,000

27%

of new IS leaders report to the CEO or president

13%

of IS leaders replaced someone who reported to the CEO or president

A recent Coopers & Lybrand study found that 56 percent of IS leaders had been with their companies three years or less and that most expected to move to a new position soon. Twenty-seven percent cited "uncertain job expectations" as contributing to their decision to leave.

Recommendations to leaders

One of our most compelling findings is the growing number of IS leaders who combine business and IS management experience. During the 1980s many large companies found their ability to exploit information technology to gain or sustain competitive advantage seriously limited by the lack of business expertise of traditional IS leaders. Many rushed to hire business executives but found them ill-equipped to deal with the dizzying pace of technological evolution and lacking the technical expertise required to make informed technology management decisions. Many CEOs and senior business executives now recognize the need for IS leaders with both kinds of expertise. Developing these "hybrid" IS leaders was a critical agenda initiative.

Offering IS leaders the opportunity to participate on interfunctional IT management and planning committees is one way companies can provide this business education. Yet it cannot substitute for direct business management responsibilities. Innovative companies are recognizing that IT professionals at all levels must become more knowledgeable about the business. These companies are establishing rotations in which IT professionals assume responsibility for relevant business activities beginning in the first three years of their careers and continuing throughout their employment. High-potential IS professionals receive significant business management experience opportunities as well. Managers of general business functions also require increased technical expertise: To meet this need some companies are redefining "management fast-track" programs to include direct responsibility for aspects of IS.

Senior IS executives who have not broadened their experience in business operations, strategy and management should develop a personal

career development program, or risk seriously undermining their effectiveness and career potential, as well as the effectiveness and career potential of those reporting to them.

Our study also has implications for executives who will be filling senior IS positions in the future. Many CEOs we interviewed sought individuals with strong business, technical and organizational experience. External hires, regardless of their background, spent most of their time with the IS unit. Internal hires with strong business backgrounds exhibited more balanced contacts among business, information systems and corporate units. Senior business executives charged with hiring new IS leaders should carefully weigh their need for organizational expertise against their need to infuse new blood into the IS function. The opportunity to develop formal "leadership partnerships" among business and technology executives can help to alleviate problems that arise from lack of either type of experience while a company attempts to develop true hybrids.

Despite the few well-publicized successes, our survey presents a picture of confusion and uncertainty on the role of the IS leader. Business and IS leaders are attempting to clarify that role and are instituting programs designed to explain the critical intersection of technology and business at all levels. They are also working on career development programs to cultivate this understanding throughout the organization. But much more needs to be done.

This uncertainty, together with inconsistent performance measurement systems, were major barriers to success for our survey respondents. Simply elevating the reporting level of IS leaders, appointing them to senior management committees and making their salaries commensurate with those of other top management positions will not ensure that new IS leaders will perform as expected. Roles must be understood by the top management team and throughout the organization. Agendas for action must also be understood and shared, and performance measurement and evaluation criteria must be consistent with the new roles and agendas.

The poor promotion record for senior IS leaders should make attracting and keeping qualified individuals a challenge. The 7 percent promotion rate for the predecessors of new IS leaders in our sample will be unacceptable for the new breed being sought by CEOs of large technology-dependent firms.

Some closing thoughts

There has been much speculation that as business managers and professionals assume more responsibility for IT, the IS leadership role may decline in importance. But over the past few years we have seen dozens of IS executives rise to new positions of prominence and influence over their companies' strategic directions.

We believe that the continued importance of IT within firms and the rapid pace of IT evolution over the next decades will demand strong technology leadership. While companies may outsource routine IT management concerns, they cannot abdicate their responsibility for leadership of IT use within the firm. Many companies that have entered into outsourcing agreements did so with the intention of washing their hands of IT problems. We recommend that these arrangements be looked upon as "strategic partnerships," demanding the same high-level management attention as other strategic partnerships.

The IS leader of the future will continue to need business and technical expertise. In the 1990s, the head of the IS function will be asked to assume even greater responsibility for business process redesign and integration, and to be a catalyst for organizational change. The hybrid IS leaders of the future must possess expertise in all of these areas. In addition, they must ensure that the organization is developing future leaders with this same combination of skills. The challenge to current IS leaders is to prepare themselves and their organizations to address these issues today and in the future. ☐

Lynda M. Applegate and Joyce J. Elam are professors of business administration at Harvard Business School and Florida International University, respectively.



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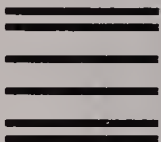
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TAKE ADVANTAGE OF CHANGESM

Organizations are
combining imaging
with other technologies
and systems to solve
highly focused
business problems

THE SHARPER IMAGE

BY PAUL KONSTADT

Users of imaging technology have found that it can be far more than just an electronic tool to store or transfer sheaves of documents. Companies that have used imaging technology as a spark for broader information initiatives have found themselves revolutionized, their advanced systems and highly integrated technology transforming computers into sophisticated instruments for unraveling stubborn business conundrums. That lesson emerged clearly from the 1990 survey of imaging users conducted for the Association for Information and Image Management. "They've learned that the real power came from the ability to integrate imaging with the rest of the information systems infrastructure," said Mark Bruneau, the senior associate at Temple, Barker & Sloane Inc. of Lexington, Mass., who prepared the report.

In small applications and large, in the public and private sectors, users have found that imaging is an indispensable building block for systems that span functions and liberate vital information for all to use. It has permitted previously undreamed-of levels of automation for essentially tedious tasks. And it has allowed senior business executives to monitor and control office

*I'm sending along a card
back that has some things
on it. Also I found out
that you might want to
letter (this). Section plan a
paper would be good also
replaces, please or to
graphic elements or to
want to*

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October 1965

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work as it is being performed, rather than waiting for after-the-fact status reports. "They actually know what's going on," said Thornton May, director of imaging research for the Nolan Norton Institute, the Lexington, Mass., research arm of the Nolan Norton & Co. consultancy. "All of a sudden they have the facts; they're not sailing by the wake."

A large-scale illustration of those powers is the passenger revenue accounting system at Northwest Airlines. It may be impossible to overstate the complexity of the airline industry's fundamental revenue accounting problem. Some tickets are

Imaging has permitted previously undreamed of levels of automation for essentially tedious tasks. And it has allowed senior business executives to monitor and control office work as it is being performed, rather than waiting for after-the-fact status reports.

bought directly from the transporting airline, others from travel agents or competing carriers. The beginning and end of each transaction is documented on paper, but important details tend to be scattered among many databases, some of which may be controlled by competitors and thus may not be completely accessible. The only generally accepted proof of a completed transaction is the canceled ticket coupon. But with hundreds of thousands of coupons pouring into airline processing centers each day, sheer volume has made it impossible to manually tally

The Blue and the Gray in Black and White

An image storage system is helping the National Archives restore a slice of American history



Confederate Army Captain Thomas Brimmer's written dispatches from the front lines of the Civil War faded to illegibility not long after his cause was crushed. The Confederacy may not have risen again in the intervening century, but Brimmer's correspondence has. It can now be read as easily as the day it was written, thanks to the National Archives' optical disk image storage system (ODISS) in Washington. "That was one of the

great benefits of [imaging] technology," said Bill Hooton, project director for ODISS, a demonstration project that electronically archived some 250,000 Civil War documents.

The capacity for this kind of recovery is latent in many imaging systems, Hooton said, because scanners generally capture far more data about the original object than the computer needs for ordinary storage and display applications. This fine-detail data is usually considered excess, but it enables specialized image processors to detect characteristics that are beyond the range of unaided human vision. For example, image processing technology can distinguish the indentations left by a pen tip or type slug on paper, even if the ink itself is faded or masked. Once the outlines of the impressions are detected and identified, they are shaded electronically so as to appear freshly created on the screen. Blemishes can be taken out by filters set to delete only the level of gray created by the stain, not the black of the print or the white of the background. Discoloration can be overcome by adjusting the contrast level. The random black marks that often appear on facsimile transmissions, xerographic copies and photostats can be identified digitally and erased. Old-style white-on-black photocopies can be reversed to recreate the original appearance of the document.

The Archives' first restoration efforts used a software processor. It was effective but slow, Hooton said, taking up to three-quarters of an hour to recalculate a typical image. Then a Vienna, Va.-based company called Image Processing Technologies Inc. offered to lend the Archives' restoration specialists its image-altering product—a circuit board that plugs directly into the scanner and works as the image is being captured. With the board, archivists could set processing parameters, scan and see the results immediately. That made it practical to search for precisely the right contrast, shading and filter settings by trial and error, testing various combinations through repeated rescanning. "We did most of our best work with [the] board," said Hooton. Since blemishes and random marks eat up disproportionate amounts of digital storage space, sanitized documents are significantly more efficient to store, he continued, but the advantages of digital restoration extend far beyond the tangible. "Being able to bring back information can be priceless."

—P. Konstadt

anything but a sample of tickets and estimate revenue totals based on that statistical summary. Such sampling was general industry practice until imaging.

In May 1990 Northwest put the first image-based ticket accounting system in the industry into production at its Minneapolis ticket processing center. According to Harold Atkins, Northwest's assistant controller of revenue accounting, the integrated system enables Northwest to catalog and account for every ticket issued in its name and every canceled ticket coupon used for passage on one of its flights.

At the core of Northwest's system is a coupon sorter with an added digital camera from Recognition Equipment Inc. of Irving, Texas. The unit simultaneously captures ticket images and optically reads their serial numbers for indexing purposes as it physically groups the documents by category. The images are stored in a FileNet server which is capable of keeping six months' worth of ticket images online.

Meanwhile a distributed network of IBM mainframes and Sun Microsystems servers collects all available electronic records associated with the ticket, gathering relevant data from the more-than-a-dozen different reservation, revenue-collection and flight-operations systems to which Northwest is connected. The network assembles a file on each transaction that includes the data and the electronic address of associated ticket images.

Tickets for which available electronic records exactly match each other and the related paper trails are identified by expert systems and processed automatically. Where there are anomalies among the electronic and paper records, or where the tickets have been modified since being written, the system first prioritizes the files, then assigns each to an auditor. Workflow monitoring software distributes the work evenly and reports the pace of work, backlogs and other operating details to managers.

"The system cut our average pro-

cessing time . . . in half," Atkins said. As a result, processing costs were cut, cash collections were speeded up and response time to customer inquiries was improved. The consolidated database also allows Northwest's accountants to verify that the correct fares were

Now resumes are scanned as they come in. They are electronically read and summarized overnight, and basic information in the electronic summary is verified by an operator the next day. Within 48 hours of a resume's receipt, summaries and resume images are available to anyone

Northwest's integrated system has cut the airline's average ticket processing time in half. As a result, processing costs were cut, cash collections speeded up and response time to customer inquiries improved. The consolidated database also allows Northwest's accountants to verify that the correct fares were charged and that agents receive the correct commission and incentive payments.

charged and that agents receive the correct commission and incentive payments for every ticket they wrote, Atkins added.

While Northwest's system is designed to move hundreds of thousands of uniform documents per day through a limited series of well-defined linear processes, the powers of imaging seem to be just as vast when applied to smaller, more amorphous routines. For example, a computer system at the corporate headquarters of Sun Microsystems Inc. in Mountain View, Calif., is getting the newly arrived resumes of job seekers to the attention of Sun's professional recruiters far faster than the computer maker's old manual methods—one to two days at present compared to one week or more previously, according to Lisa Milligan, the Sun human resource information systems project manager who installed the system.

During the old paper era at Sun, said Milligan, the 400 to 500 resumes that arrived each day were sorted and categorized by hand, then reproduced so that each recruiter could have his or her own copy to evaluate.

on the network.

The old paper-based operation forced recruiters to either maintain their own indexes to the resumes or to manually sort through their active files each time they received a new requisition. Now, using their workstations, recruiters have access to the electronic summaries for rapid searches. Where it once took four full-time clerical workers just to copy and sort the flood of incoming resumes, Sun now employs two, Milligan said, "and those two now have time for special projects."

The Sun system was built by Resumix Inc. of Santa Clara, Calif., and can run on Sun or Digital Equipment Corp. workstations. The system uses optical character recognition (OCR) to translate pictures of scanned-in text into ASCII characters that can then be processed by the machine. Once the OCR finishes its job, the image is stored and the ASCII translation is worked over by an expert-system-based full-text search and retrieval program. Following a knowledge base of conventional resume structures and job descriptions, the system picks out the applicant's name and address and key points

about education, employment history and career objectives. It assembles that data into an abstract and files the abstract in a database that a recruiter can consult for any particular characteristics. Anyone who needs to amplify the information contained in the abstract can call up the original document's image.

While imaging coupled with OCR, expert systems and similar technologies has raised processing horizons to new levels, the marriage of imaging with communications has done something similar for data access and distribution. At the Middlesex South Registry of Deeds in Cambridge, Mass., an imaging system has enabled officials to offer real estate lawyers, appraisers, tax assessors and others unlimited remote access to all real estate documents in the image database.

Operating under the trade name LandTrak, the system allows subscribers to search the master real estate records index from their own personal computers, then have copies of imaged documents automatically faxed to the machine of their choice. The basic imaging system provides the standard benefits of electronic document management: reduced paper storage costs, savings on handling and ease of access, according to Register Eugene C. Brune. But LandTrak has proved to be the real boon—an important new source of revenue for the cash-strapped agency. "We think that within three years we should be doing close to \$400,000 a year," Brune predicted.

The Registry has been putting images of all newly filed real estate deeds, mortgages, liens and related documents into its Wang Laboratories imaging system since early 1990. A pilot database made up of just court-registered land documents extends back to August 1989. Some 200,000 documents covering about 800,000 individual pages were imaged during the first year of full operation. Officials are currently evaluating proposals to convert older documents from microfilm to digital

storage, Brune said, and by next year the county hopes to have all records back to 1958 online (1958 is the starting point of the existing electronic document index).

The day when all real estate document searching in southern Middlesex County can be done by remote computer still appears to be far in the future, since title transfer searches usually trace the paper trail back 50 years or more. But the larger the

While imaging coupled with optical character recognition, expert systems and similar technologies has raised processing horizons to new levels, the marriage of imaging with communications has done something similar for data access and distribution. One system has enabled remote access to Registry real estate documents.

imaged archive grows, the greater its usefulness for other real estate purposes. For example, full title searches are typically done weeks or months prior to the consummation of a property transfer; they need to be updated just before the buyers and sellers sign all the papers.

"This system helps us avoid last-minute problems by having the information available when we need it," explained Paul Miller, the paralegal in charge of real estate title searches for the Braintree, Mass., law firm of Perlman, Rubin & Stein. Many of the firm's deals are closed in the commu-

nity where the property is located, which can be as much as 25 miles from the official archive. Before LandTrak, the firm would have stationed an agent at the Registry, and that person would have had to hand-carry copies of any last-minute filings to the closing site. "That could be very costly," Miller said.

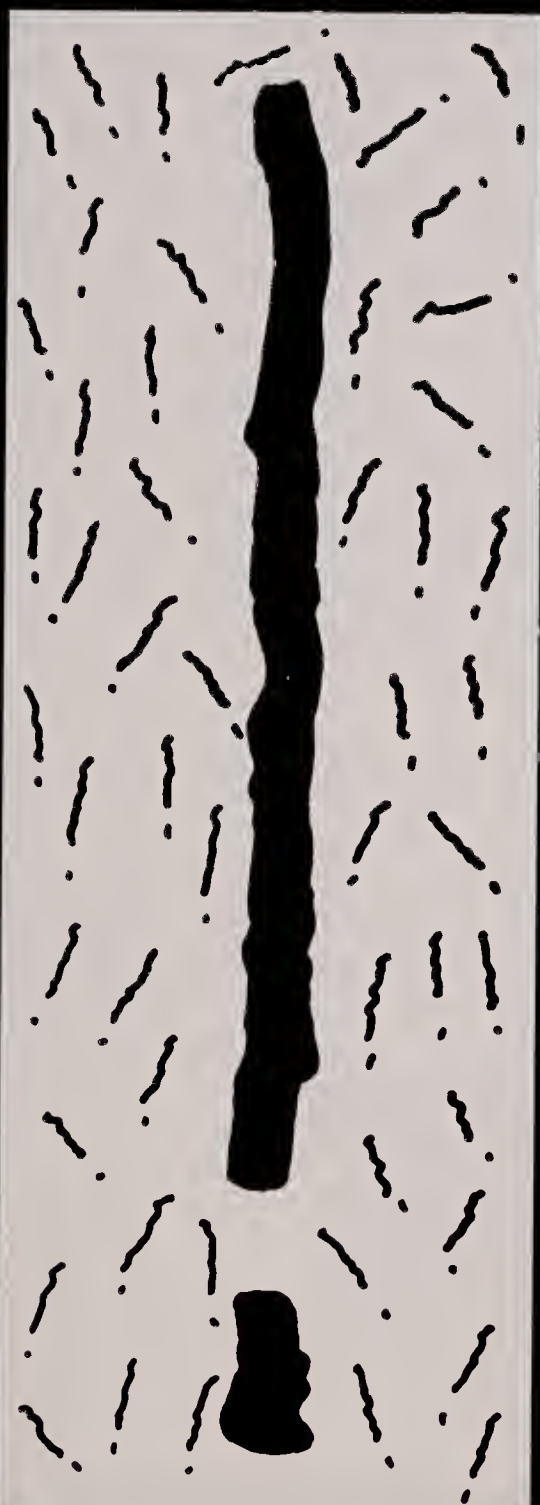
The Registry's \$600,000 imaging package was purchased as an add-on for its already-installed Wang VS-based indexing system. The imaging upgrade includes an optical-disk jukebox capable of handling 85 12-inch platters, image adapters for four existing terminals, a scanner and a fax modem for transmitting images. The marginal cost of operating LandTrak is negligible, according to Brune, so its fees are almost pure profit. The software for remote access to the Registry's computers costs the user \$100; setting up the account costs another \$100. Connection charges run 50 cents a minute. One year into the project, there were 71 subscribers paying a total of about \$2,000 a month. "That's where the system will pay for itself," Brune said.

The initial price tags on the other integrated image systems were also high, but the benefits they brought were substantial. Northwest's Atkins said the airline's investment is measured in millions of dollars and work-centuries of aggregate effort. At the peak of the four-year-long development cycle, more than 170 people were at work on the project, re-engineering workflows and creating custom device drivers and hardware interfaces. But as steep as those numbers are, Atkins believes the payback will more than match them. "There is a bottom-line impact . . . a combination of tangible and intangible benefits that [is] substantial," he said.

For Sun Microsystems the purchase price was only part of the cost. Sun helped finance initial system development efforts by funding an advance order; then its recruiters served as guinea pigs by using an early model of the Resumix system that was handicapped by a glacially slow database. Milligan, the Sun proj-

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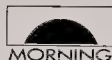
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Reception and Dinner
Hosted by Corporation for Open Systems International (COS)
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"2020 Vision: Winning in the Information Economy"

Tuesday, June 4, 1991



7:00 a.m.

Registration and Breakfast
Greeting: Phillip R. Evans, ICA President

8:00

James D. Robinson III, American Express Company
*"The Strategic Importance of Corporate Telecommunications"**
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9:15

James D. Robinson III, American Express Company
Question and Answer Session
(For Executive Program attendees)

10:00

John W. White, Texas Instruments
"Business Trends Impacting Communications"

10:45

Stephen A. Hudson, Corporation for Open Systems
International
"Strategic Emerging Technologies: The Next Five Years"

11:45

James Sobczak, The Saturn Group
"Using Telecommunications to Achieve Competitive Advantage"



12:30 p.m.

John W. White, James Sobczak, and Stephen A. Hudson
Question and Answer Session

1:00

Lunch
Hosted by CIO Magazine

1:45

Tour of the ICA Exposition and *"The City of Solutions"*
Showcase at the Anaheim Convention Center
(open until 5:00 p.m.)

*Feature Session at ICA Conference

Dr. William H. Davidson
Chairman
Mesa Consulting

Associate
Professor
USC



Bill Davidson is Associate Professor of Management and Organization at the School of Business Administration, University of Southern California. He is heavily involved with Pacific Rim business relations and business development.

He has written a series of books on global business and management, including: *Managing the Global Corporation*; *U.S. Competitiveness*; *Revitalizing American Industry*; *The Amazing Race*, and his most recent, *2020 Vision: Winning in the Information Economy*.

Dr. Davidson is the founder of Management Education Services Associates (Mesa) which specializes in international management development activities and consulting. His graduate degrees, earned at Harvard University, are in international management.

James D. Robinson III
Chairman &
CEO
American
Express
Company



Since 1977, James D. Robinson III has served as Chairman and Chief Executive Officer of American Express Company.

Mr. Robinson is a leading private sector spokesman on international trade and finance, including trade in services and the international financial system, as well as on U.S. financial policy. He serves as Chairman of the Advisory Committee on Trade Policy and Negotiations, Co-Chairman of The Business Roundtable and as Chairman of its Task Force on International Trade and Investment. He is a Director of the Council on Foreign Relations, the Japan Society, Bristol-Myers Squibb Company, The Coca-Cola Company, and Union Pacific Corporation.

Mr. Robinson earned an MBA degree from the Harvard Graduate School of Business Administration.

John W. White
President
Information
Technology
Group



Vice President
Texas
Instruments Inc.

John W. White is Vice President of Texas Instruments Incorporated and is President of TI Information Technology Group.

Previously he served as Manager of Information Services and was responsible for TI's worldwide Computing/Communications Network. From 1977 to 1989 at TI he held the positions of Manager of Information Systems and Services (IS&S), Assistant Vice President, Vice President and Senior Vice President of IS&S.

Mr. White holds degrees from the University of Kansas and Central Missouri State.

Stephen A. Hudson
Chief Executive
Officer
Corporation for
Open Systems
International



Stephen A. Hudson is the CEO for Corporation for Open Systems International (COS). With more than 22 years in the computer industry, he is responsible for all aspects of COS' current and future activities. Previously, as the Chief Operating Officer he directed internal operations of the company including COS'

strategic development activities and commercial services.

Before joining COS, Mr. Hudson was a Principal in the Government Systems Group at Booz Allen & Hamilton. He also served as Vice President of Technical Operations for Martin Marietta Corporation's Information Systems Group.

Mr. Hudson has an MS in operations research from the University of Houston.

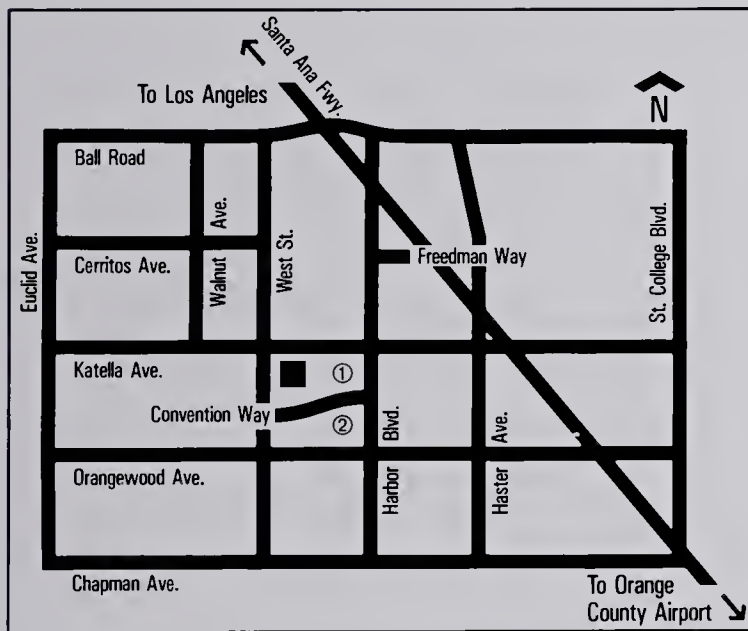
James Sobczak
President
The Saturn
Group



James Sobczak is a consultant specializing in marketing studies for telecommunications suppliers. He has considerable telecommunications management experience, having been responsible for managing the telecommunications departments at Ford Motor Co. and the Bank of America. He has served as Vice President of Sales and Marketing at CONTEL ASC and Westinghouse Communications.

As a former President of the International Communications Association (ICA), Mr. Sobczak has been widely published in industry trade publications. He is a frequent speaker at major industry conferences.

Mr. Sobczak has an MBA from the University of Detroit.



On-Site Registration

If you arrive on Monday, June 3, by 5:00 pm, please proceed to the ICA Conference registration area at the Anaheim Hilton & Towers (located across the street from the Anaheim Marriott). If you arrive on Tuesday, June 4, please proceed to the Anaheim Marriott in the Orange County Ballroom on the lobby level.

Evening Reception and Dinner

Executives are invited to a reception and dinner on Monday, June 3. Hosted by the Corporation for Open Systems International (COS) exclusively for the Executive Program participants, this event features Dr. William H. Davidson, author of *2020 Vision: Winning in the Information Economy* and *Managing the Global Corporation*.

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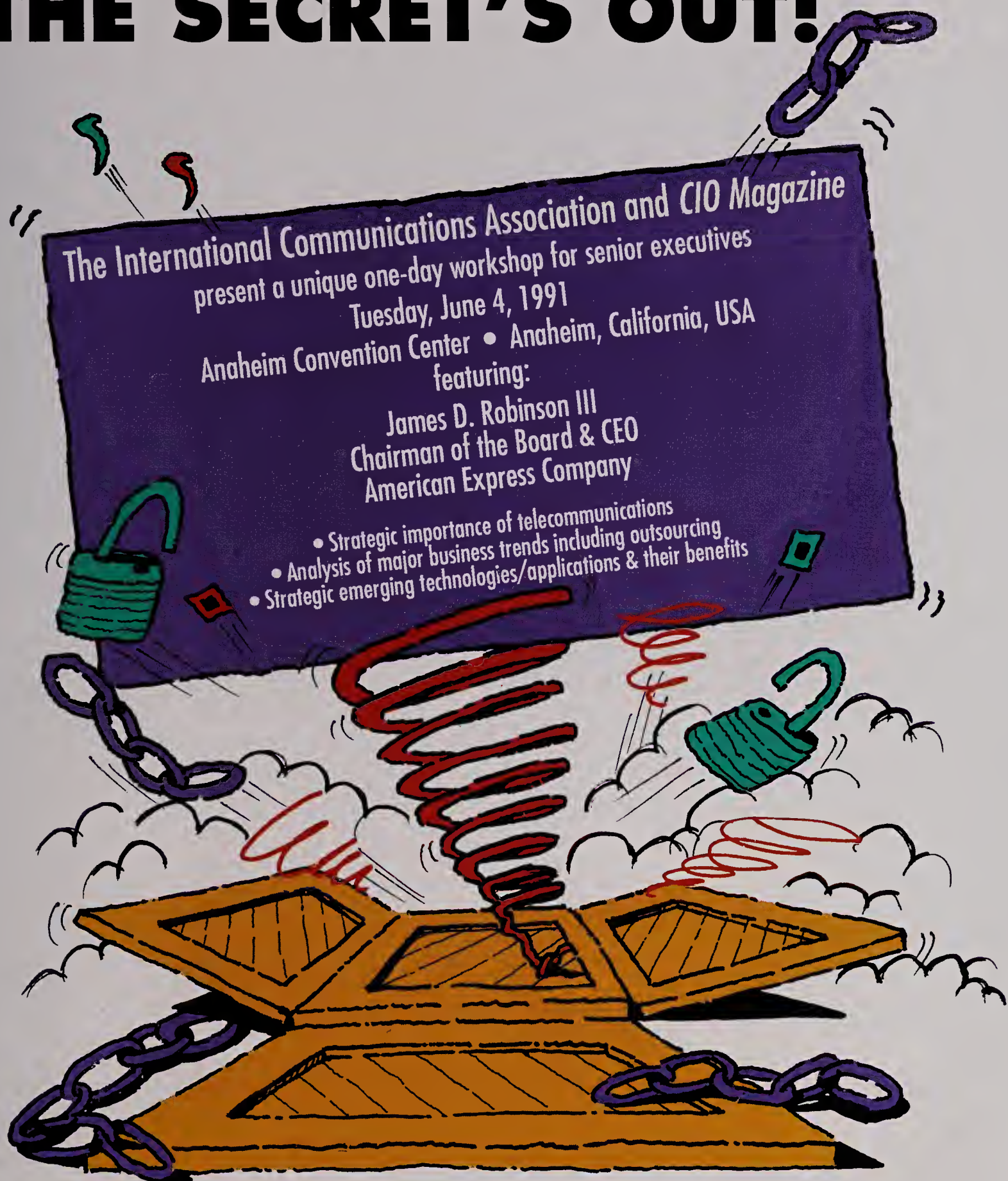
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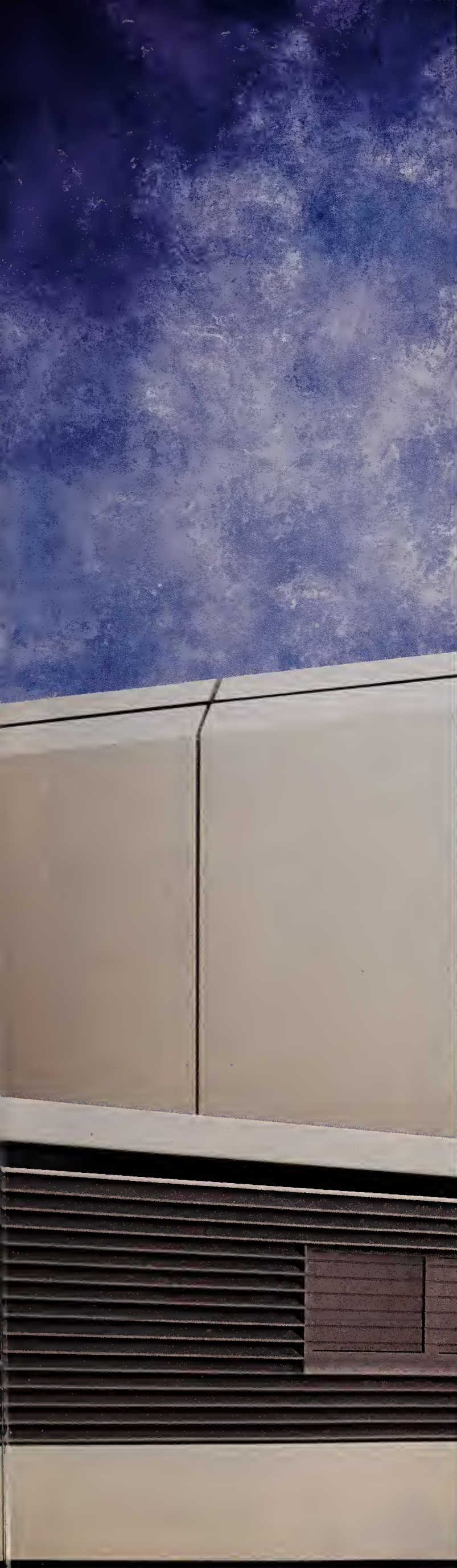
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Sources: *U.S. Users Ratings of Mainframes*, 1990, Datapro Research Group. *Nikkei Computer Survey*, 1990, Nikkei Business Publications. *French User Ratings of Mainframes*, 1990, Datapro Research Group.
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*This chart is an excerpt from Deloitte & Touche's "Detailed Research Document on Optical Disk Based Document Imaging Systems," which will be available through the Association for Information and Image Management in Silver Spring, Md., after April 1, 1991.

ect manager in charge of the effort, brushed off those problems as "growing pains [to] work out all the kinks." Now, she said, it is a "great system."

While the vast powers of these systems might seem self-evident, they were often accepted only after internal struggle. At Northwest Airlines the adoption of the image-based system required an intense political effort, with market-

sume system represented the first core change to recruiters' jobs brought about by IT, and as a result, there was much initial end-user resistance. Milligan thinks that direct pressure on recruiters from senior executives would have eased the way for the system, but in the end she had to wean them from their paper file "security blankets" one by one. "Once we sold them, they were very pleased and would refuse to go back

Although the vast powers of these systems might seem self-evident, they were often accepted only after internal struggle. At Northwest Airlines the adoption of the image-based system required an intense political effort. Sun's automated resume system represented the first core change to recruiters' jobs brought about by IT, so there was much initial end-user resistance.

ing and accounting joining forces to press senior management for a cross-functional system that met both their needs synergistically. "We could not support the increased [processing] volumes, and marketing wasn't getting enough information to enable them to make the strategic decisions they should be making," Atkins said.

The keystone in their alliance was the massive database created by the system: a compendium of the origin, destination and routing of each passenger trip involving the Northwest system. This information allows the accountants to measure revenue in great detail. It also helps marketers decide which competitors' fare promotions to match and which to ignore, identify over-served and under-served markets, and audit the effectiveness of their load management programs to help ensure that they continue to charge the highest practicable average fares. "We could not have justified the system on our own," Atkins said.

At Sun the problem was more one of acceptance—the automated re-

to manual files," she said. Milligan estimated that she has succeeded with 85 percent of her end users, while the remainder may never fully accept the new way of doing business.

Milligan's experience supports the research findings of May at Nolan Norton. He said that IS managers are running into a new level of end-user skepticism about complex information systems, and that traditional sources of technological authority are now routinely discounted in favor of personal observation. "IBM said so," is not good enough any more," May said. "Every line manager and every clerk is now from Missouri and saying, 'I want to see it, touch it and feel it before I agree to move forward.'"

That may impose heavy selling and human relations burdens on imaging advocates, May continued, but it appears to be the only way to end up with systems that both provide business benefit and have wide acceptance. "We think that's the right way to build systems," he concluded. ☐



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DEPOSITS AND WITHDRAWALS

On balance, IT has made powerful contributions to banking, but the current dire climate has forced bankers to concede that technology is no substitute for sound business decisions

BY THOMAS KIELY

Forgive bankers for scowling when they hear trade yawp about some new technology that could make them more competitive. Or more profitable. Or more efficient. It's a lie, and bankers know it. During the last 30 years the nation's banks have spent billions of dollars on hardware and software, and bank CIOs are keenly aware of what technology can do. Basically, what they've learned is that technology doesn't count.

It isn't as though bankers regard information technology as snake oil. After all, technology has vastly improved banking productivity. The legions of bank clerks who once shuffled checks and tabulated savings-account interest have been replaced by computers. Automated teller machines, after a slow start, dramati-

cally changed the nature of a bank branch. And technology has allowed banks to invent new products—such as variable-rate mortgage loans—and reshape old ones, such as checking accounts. But in the last few years bankers have watched a dark night descend upon their industry, and with it has come the realization that technology is a tool, not the business.

There is nothing inherently strategic about technology—an obvious point, but one that bankers are chanting these days like a mantra. In an industry as information-rich as banking, savvy managers have long preached that new transaction processors or imaging systems themselves wouldn't transform a losing competitor into a winner, or a winner into a giant. Rather, it is the strategy for employing technology that counts—and such a strategy must be

FRED CISEWSKI: *Bankers have adopted the most expensive delivery system of any industry.*

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AUSTIN A. ADAMS is utilizing technology to provide new information products to his bank's managers, loan officers and sales force.

tied to the business vision of the institution. The problem bankers face today, as their industry cracks and shudders under the weight of enormous change, is trying to figure out how to translate that axiom into practice.

Banking is now a lousy business. Once it was a cozy, powerful profession. Throughout the 1950s and '60s the nation's commercial banks and savings and loan institutions took in deposits and made loans, and life was wonderful. Banking was an Oz sustained by federal and state banking laws. These laws, most of which were instituted in the wake of the Depression, kept the industry fragmented—bottled up in geographical areas—restricted banks' products,

regulated interest rates and insured deposits. Regulated, it was a safe, stable business in a relatively uncomplicated world.

But financial currents changed in the 1970s. Banks began to lose depositors to higher-interest-bearing money market funds and, more importantly, lost corporate borrowers to unregulated non-banking lenders such as pension funds, insurance companies and giant financial services firms like Stamford, Conn.-based GE Capital. (With nearly \$60 billion in assets GE Capital dwarfs most banks.) By the early 1980s federal lawmakers reacted to these changes by loosening their grip on banks, authorizing interstate banking in gradual stages, continuing through 1995, and allow-

ing banks to compete on interest-bearing accounts.

A decade of partial deregulation later, banking profits are absolutely miserable. Now bankers must also grapple with calamitous loan portfolios, in many cases chockablock with declining real estate values, crashing LBOs, bankruptcies, even rising consumer loan defaults. According to the U.S. General Accounting Office, over 1,000 banks failed in the 1980s (about double the number of failures recorded between 1934 and 1979): 630 of those in the last three years of the decade. The FDIC estimates that another 200 of the nation's remaining 13,000 banks will collapse in 1991. With all these failures—including big ones, like the \$23 billion Bank of

New England taken over by the government last January—the Bush administration estimates that the Bank Insurance Fund will run out of money next year. (To top this all off, of course, taxpayers are picking up the estimated eventual \$500 billion tab for insolvent savings and loan associations.)

In this atmosphere, banks have drastically pared back their once-aggressive spending on information technology. The Index Group, a Cambridge, Mass., consulting firm, estimates that while banks' budgets for IT grew by double-digit percentages in the early and mid-1980s, that growth has slowed to just over 2 percent in 1991. And William McGee, partner in charge of KPMG Peat

In an industry caught up in dramatic economic change, technology has ceased to be a strategic tool and has become a complicated problem—but only because managers allowed this to happen.

Marwick's financial institutions' consulting practice in New York, says that, in general, banks aren't spending those dollars on long-range strategic projects so much as on quick projects to stay competitive.

But strategic planning is on everyone's mind. For Michael Simmons, executive vice president at the Bank of Boston, strategic thinking begins with a critique of the structural flaws of his industry. "There need to be something like 10,000 fewer banks in this country to get this industry in

shape," Simmons said. Government has to "change the ground rules" to allow banks (which are constrained from offering some financial products, such as mutual funds) to battle competitive offerings from non-regulated financial powerhouses like Fidelity or GE Capital. "If you tie up a racehorse to a fence, a donkey can win the race."

Speaking for many bankers, Simmons also said that government must hasten the elimination of laws that prevent banks from expanding outside their geographical regions and from acquiring smaller banks. This is

one way for banks like his to obtain much-needed capital. (The Bank of Boston is in tough shape, and it is the largest bank in a region where several banks will likely come a cropper in the next couple of years.) Of course, his own bank is nervous about the possibility that strong outsiders—perhaps even Simmons's former employer, California-based BankAmerica—could pick up the (presumably choicer) pieces of the failed Bank of New England and compete with Bank of Boston on its home turf. (As of press time, Bank of Boston and three other regional banks had bid to pur-

Fee Enterprise

Two banks' outsourcing pact could be a sign of things to come

The Mellon Bank has set its sights on outsourcing. The Pittsburgh-based institution posted \$350 million in revenues last year from data processing and related fee-based services to about 700 financial institutions. Mellon isn't unique in this market, and competitors include not just other banks (such as Citicorp) but also EDS, IBM and Systematics. But Mellon's top officers have decided to aggressively beef up its outsourcing business, and that will push Mellon into more complex territory, as the banking industry changes.

Last fall, for example, Mellon beat out seven competitors to win a multi-million dollar outsourcing contract from the \$4.5 billion Dollar Dry Dock Bank of White Plains, N.Y. Dollar Dry Dock wanted more than just leased MIPS, however. The two banks entered into what Dollar Dry Dock Executive Vice President and CFO Charles Richardson calls a "hybrid relationship." Some of Dollar Dry Dock's software will run on Mellon's iron, but over the six-year duration of the contract, the New York bank will also migrate to selected Mellon applications.

For instance, Mellon will run Dollar Dry Dock's commercial and corporate loan systems, but Dollar Dry Dock's IS group will retain control over the software, making any program and maintenance changes themselves. On the other hand, Dollar Dry Dock intends to deep-six its own mortgage servicing, general ledger and deposit systems in favor of Mellon packages. "The commodity back-office systems [will be] 100 percent Mellon," said Richardson, "but I've outsourced nothing of strategic significance—which is everything that touches the customer—to their facilities." Richardson estimates that 70 percent of his bank's systems are commodities. He expects to cut by 30 percent his annual \$14 million data processing costs.

Mellon also intends to hunt for customers outside the banking industry and has considered forming alliances (details of which it will not comment on) in order to expand its outsourcing services.

—T. Kiely

chase parts of the failed bank.) If Bank of Boston is not permitted to expand as well, how can it compete with interlopers?

But if a level playing field can be achieved, Simmons added, "then banks have to realize there are things they are doing that are commodities. Banks need to be able to consolidate those things that are commodity services [such as check processing] and then market [the] differentiation between them." Just as banks have jointly managed ATM networks, they could more cost-effectively process checks (an expensive fixed cost) as a group, outsourcing the processing to a bank or an independent service provider.

There is nothing strategic about commodity services, but the banking industry is awash with them. Throughout the 1970s banks largely used technology to automate routine tasks such as account updates and general ledger maintenance, then brought technology out to the front of the bank with teller terminals and, later, outside the bank with ATMs. This was the "strategic" use of technology during that era. In the 1980s technology was pressed to introduce new "information" products, such as variable-rate mortgage loans.

"We're going to have to change the way our customer does business with us."

—Fred Cisewski

Diogo Teixeira, a partner in Ernst & Young's Center for Information Technology and Strategy in Boston, and his colleague, McKinsey & Co. Partner Thomas Steiner, estimated in their 1990 book, *Technology in Banking*, that "more than 90 percent of [the banking industry's] current expenditures on technology go into essentially routine tasks, which provide few opportunities for distinctive performance and profits. . . . The other 10 percent or less . . . goes to support truly differentiable business approaches."

Managers, not machines and code, must take the rap for this. In an industry that has lost control of its markets, an organization offering traditional products and services may own snazzy processors and employ a well-managed IS group but still find its margins shrinking. In an industry

caught up in dramatic economic change, technology has ceased to be a strategic tool and has become instead a complicated problem—but bankers concede this is only because managers allowed it to happen.

Bankers have saddled themselves "with the most expensive delivery system of any industry," lamented Fred Cisewski, senior vice president and MIS director at Bank South Corp., in Atlanta. Cisewski looks at the structure of his industry for solutions too—but unlike Simmons, he focuses on the customer.

"We're going to have to change the way our customer does business with us," Cisewski said. More than three quarters of the banks' retail transactions can be handled by ATMs or point of sale (POS) terminals in supermarkets, retail stores, gas stations and so on. Like many other bankers, Cisewski would prefer to see customers adopting POS banking. "Why put a \$30,000 ATM out there when I can put a \$900 terminal in any kind of establishment where customers do normal business? I could save [the cost] of building that brick and mortar facility, and it's not my labor doing the transacting."

But driving down the costs of delivering those services is only a partial solution. Cisewski also believes that banks should specialize and shed many of the traditional banking services they now offer. The difficulty is figuring out which business lines to retain and which to abandon—or, effectively, how to reshape the whole nature of the bank. Bank South, for example, has gotten out of the credit-card business, and it may stop making mortgage loans too. In the future it will likely pay more attention to local corporate customers and less to consumers.

Partnerships with technology vendors can help a bank to reshape itself and compete, Cisewski argues. For instance, a bank and a vendor could team up to offer POS services, with the understanding that this partnership could evolve—technologically, as well as in a business sense—into other related services such as electronic



H. EDWARD NYCE: Banks must re-engineer their technology-supported business processes.

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H. Edward Nyce, executive vice president at Manufacturers Hanover Corp. in New York, foresees vendor-bank partnerships "that perhaps push a given application out into the marketplace," and consortia of the sort that Bank of Boston's Simmons advocates. Like most others in his industry, Nyce anticipates many bank mergers ahead, and this too will help to cut technology costs and overcapacity. (Manufacturers Hanover itself is a rumored merger candidate.) Nyce also led an aggressive effort at

"We classically built systems around products. I think everyone has seen the need now to focus on the customer."

—Martin Bronstein

his bank to consolidate data centers, and he says the bank is now looking closely at each line of its business with an eye toward cutting more systems costs.

While cutting technology costs is essential—and strategic—in a changing industry, Nyce argues that it is equally imperative for banks to re-engineer their technology-supported business processes. During the big industry automation push of the last 30 years, he observed, "we were automating a lot of the current practices. And although we were reducing the head count, we were probably not getting the level of payback that we could have had if we had gone in and re-engineered the process."

Re-engineering a bank's information is still another strategy for mak-



WALTER LEONARD: *His bank has been offering fee-based services for over 20 years.*

ing better use of data the bank has already paid money to collect, noted Austin A. Adams, executive vice president at First Union Corp., in Charlotte, N.C. Adams is adapting the 1980s strategy of utilizing technology to provide new information products—this time not to consumers, but to the bank's managers, loan officers and sales force.

"It's the whole idea of focusing on the information our bank needs," Adams explained. "Are there more creative, more unique ways of aggregating and presenting that information [for use in the bank]?"

Martin Bronstein, senior vice president at First Chicago, agrees. "We classically built systems around products," he said. "I think everyone has seen the need now to focus on the customer. You have to cut things the other way—take those product systems and extract information about customers" that can be used by the bank's marketing and sales teams.

Other banks, including Manufacturers Hanover, want to use this infor-

mation in executive support systems. "We built transaction processing systems [in the 1970s and 1980s]; we didn't build MIS systems," said Nyce. "What we really have to do today is get down in those transaction systems and turn them around into meaningful information for senior management."

But Ernst & Young's Teixeira wonders whether efforts to slice old information in new ways really go far enough. Banks that intend to use information internally "are thinking about how to use it to sell banking services." But they are missing an opportunity, he argues. Referring to a quote by John S. Reed, chairman and CEO of Citicorp, about banking being an information business, Teixeira said: "What I would love to hear a bank say is that what it ought to do, if it's really in the information business, is to rethink what it does, so that it sells not banking services at all but data/information. There would be great opportunity [for a bank] to create a distinctive business approach doing that."

Differentiation is key to effective strategic planning. Some fortunate banks realized this a few years ago and used technology to change their spots. CoreStates Financial Corp., in Philadelphia, is a bank that has become some other kind of financial entity. "We're a processing business," explained Executive Vice President Robert N. Gilmore. "We support the proprietary banking interests of the CoreStates banks, and its various products and markets, but we're also a pure processing business."

CoreStates evolved out of what was once the Philadelphia National Bank. In the early 1980s the bank's business was under pressure. Its executives looked frankly at their markets, their competition, their dwindling corporate customer base and at the bank's new ATM networking business, and they decided to follow a path that appeared profitable. Henceforth, the bank's biggest growth would come from non-interest revenues gleaned from offering transaction processing services.

"We would still make [corporate] loans," Gilmore explained, "but we would not look to that segment of the business for earnings growth, so we wouldn't be forced to make more risky loans to generate increased earnings. In 1980 about 90 percent of the income of the institution was generated through corporate lending. Today that number is about 10 percent. Our consumer business and our fee-based transaction processing businesses account for about 85 to 90 percent of our earnings." About 45 percent of the bank's earnings are strictly fee-based.

CoreStates owns and operates a shared ATM network. About 1,000 banks and credit unions in several states use the network. Also, CoreStates maintains a national POS network comprising over 50,000 terminals that do well in excess of 200 million transactions a year. Gilmore hopes to leverage his transaction processing bag of tricks to sell his customers additional services in the months ahead. As a sign of the changes, he says his biggest competi-

tors in POS services are non-banking heavyweights such as Sears, JCPenney and McDonnell Douglas.

First Wachovia Corp., a bank in Winston-Salem, N.C., also leapt into fee-generated processing markets—over 20 years ago. "As a relatively small regional bank we were not in a position to compete with the large money center banks for loans [to] a lot of the large corporations outside our market area," said Executive Vice President Walter Leonard. Wachovia (traditionally a conservative lender anyway) decided that it could grow by offering fee-based services. In the 1960s the bank began to service student loans. Since then it has expanded into trust services and other non-credit markets.

ed out that "any investment we [at Citicorp] make today has got to yield benefits today." But Crook went on to say that his industry has for many years regarded systems as either long-term and strategic, or tactical and immediate. IS executives have put systems in these dichotomous terms when selling them to their CEOs, and CEOs have looked upon systems as a choice between black and white, yes and no, zero and one.

Now, said Crook, systems must be both strategic and tactical. "The key is to make these two mutually consistent," he said. "And that's very tough to do, in my opinion." For Citicorp, which reportedly spends about \$1 billion a year on information technology, the long-term strategy is global

"Those banks that have made technology part of their revenue generation base have a distinct advantage over those of us who have expended our energy more in terms of growth."

—Austin A. Adams

Said First Union Corp.'s Adams, "To be really candid, those banks that have made technology part of their revenue generation base [such as CoreStates] have a distinct advantage over those of us who have expended our energy more in terms of growth." The cost of entry into processing markets has now become prohibitive. "That's one effect of today's environment. There [will be] virtually no new entrants [among] banks in some of these technology-based revenue-generating areas."

Add to this hugger-mugger of perspectives one more. Colin Crook, chairman of the corporate technology committee at the nation's largest bank, New York-based Citibank, views the strategic use of technology more philosophically—and architecturally—than his colleagues. Echoing Peat Marwick's McGee, Crook point-

banking, integrated databases, big integrated networks and pushing employees closer to the customer. In the short term, new systems must hit the ground running, yet also be part of the long-range vision.

To complicate matters, technologists must build systems flexible enough to expect the unexpected. The course of the banking industry is uncertain, unfolding. It is far easier to plot the evolution of technology over the next decade—the MIPS and economics of machine and code—than it is to anticipate the twists and turns it is likely to take. Technology planners must prepare to be surprised.

"Banking will be one of the most exciting industries over the next 20 years," concluded Simmons. "I mean, if we live through the next 10, the following 10 will be exciting." CIO

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THE GREENING OF THE BOTTOM LINE



If you think recycled paper products represent the ne plus ultra of corporate environmental awareness, think again. Despite the growing popularity of green marketing, the biggest corporate environmental challenge exists not for the clean companies but for the biggest polluters in the nation—manufacturers. These businesses are struggling to keep track of hazardous chemicals in their operations. Tracking hundreds or thousands of chemicals from delivery to finished product and sometimes beyond is no small task, however, and faced with the prospect of lawsuits and heavy fines, companies hope that information technology will turn out to be the greenest solution of all.

The environmental issues motivating companies today are primarily legal. The Environmental Protection Agency requires yearly reporting of emissions of 300 different chemicals. Local environmental groups want to know who's putting what into the environment. And not only is the federal government pursuing enforcement more adamantly, but it is going after companies for total emissions rather than for specific chemicals. Increasingly, businesses and environmental groups alike are realizing that the free and effective flow of information is a key tool for managing toxic substances and maintaining an informed citizenry.

Efforts to track information range from the basic to the ambitious. Occidental Petroleum Corp., a diversified chemical, oil and gas company based in Los Angeles, has been able to track "reportable" emissions from its hundreds of facilities nationwide with a mainframe-based exception reporting database. Ac-



ON THE SPOT: Professional handlers (above) collect hazardous waste materials. In offices far removed from the front lines of toxic-waste management, executives are also working to clean up the environment.

Businesses are beginning to realize that the free and effective flow of information is a critical factor in dealing with increasingly stringent federal standards for managing toxic substances

BY MEGHAN O'LEARY

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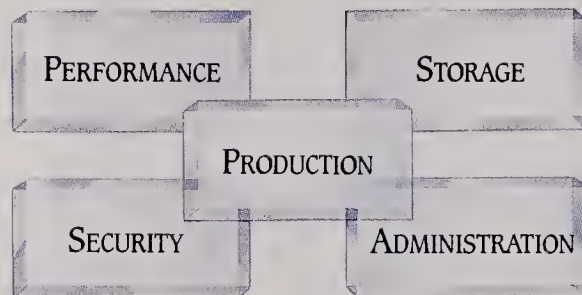
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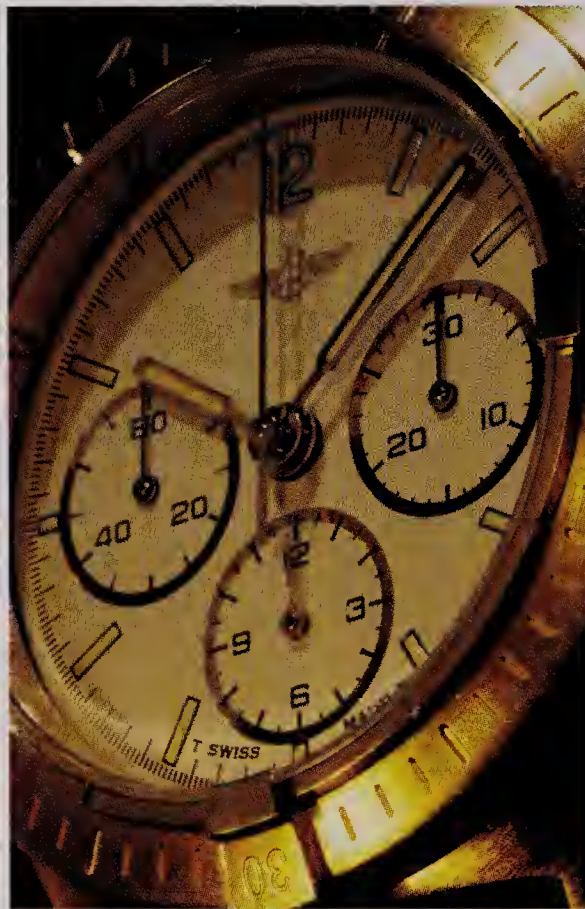
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cording to Frank B. Friedman, corporate vice president for health, environment and safety, the database generates reports only on emissions that are outside of preset acceptable parameters, because "you don't want every bit of data," and because these incidents require a special federal reporting procedure and internal attention.

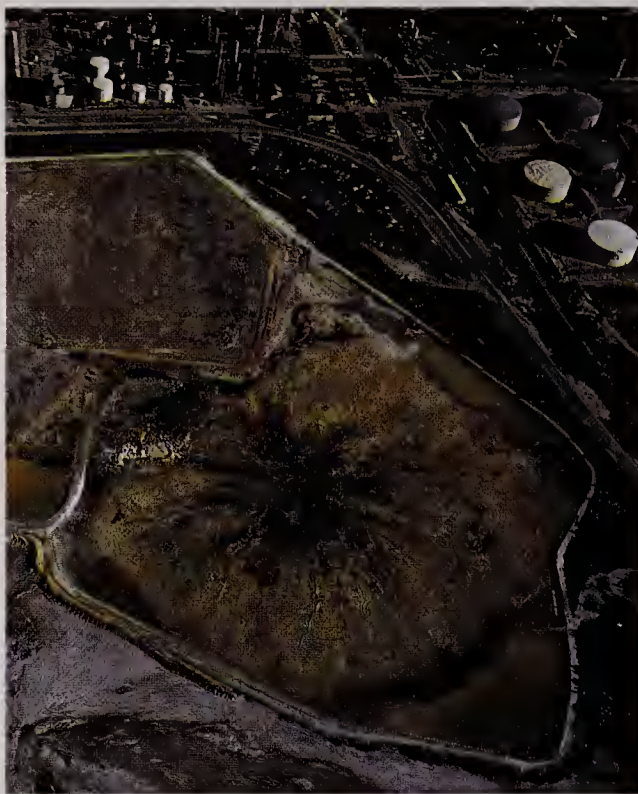
Still, tracking of reportable emissions, however faithful, may not provide enough future protection for companies that emit hundreds of other chemicals. Increasingly, companies are being held responsible for the long-term effectiveness of their waste-disposal and cleanup efforts. With this in mind, many companies have chosen to go beyond federal requirements and keep track of every chemical they use, manufacture or emit, setting lower emissions goals and using information technology to monitor progress as well as spot trends and potential problems. Many companies pair such endeavors with public information programs.

The Monsanto Co. of St. Louis, for instance, recently announced a voluntary program to achieve a 90 percent reduction in air emissions by 1992. It also announced a number of other water and land waste-reduction programs that will require extensive emissions tracking at all of its plants nationwide. (Monsanto is currently involved in a costly cleanup of waste it disposed of in the '60s and '70s in what was then a legal and state-of-the-art manner.)

Dennis Redington, a director of regulatory management at the company, said that Monsanto's databases, which contain information from the company's plants around the country, are used internally to gauge its progress on reduction. Redington calls them "living" databases because they are changing and expanding "as our plans are refined and strategies improved."

While companies such as Monsanto are considered to be at the forefront of proactive environmental management, they may not remain ahead of the game for long, because effective environmental information management increasingly involves sharing that information—not just with the government, but with environmental and citizens' groups or anybody who wants it.

In 1986 Congress mandated that the EPA



IT HELPS monitor the activity of waste refineries.

Many companies have chosen to go beyond federal requirements and keep track of every chemical they use, manufacture or emit.

make available to the public its databases of yearly emissions reports from every major manufacturing facility in the nation, according to Steven Newburg-Rinn, chief of the Public Data Branch Office of Toxic Substances of the EPA. This unique data collection is available online as well as on diskette, microfiche and CD-ROM to anyone willing to pay the \$18 to \$25 per hour connect charge or \$500 for the 80,000 reports on disk. "I have long felt that a lot of [the EPA's] power rested in the information we had, rather than our ability to pass regulations," said Newburg-Rinn. "Usually by the time the regulation was passed, the information

was out and people were making the change [anyway]. You do need regulations because some people aren't going to change, but information has a very important role."

The National Library of Medicine's Tox-Net system also provides online access to EPA emissions information—and to databases of the properties and effects of specific chemicals as well. "It's not enough to know that the plant down the block has benzene," Newburg-Rinn explained. "You need to know what benzene does."

In fulfilling its mandate to arm the public with information, the EPA believes that environmental and community groups are likely to interpret the information differently, finding trends that government agencies might miss and mobilizing to reduce pollution at a regional level—something the government hasn't the resources to do.

Both Congress and the EPA hope that the information might instruct companies as well. A part of the Pollution Prevention Act of 1990 states that the EPA must collect information on what companies are doing to reduce emissions. While Newburg-Rinn acknowledges that many businesses view government information programs as an opportunity to spy and be spied upon by other businesses, the opportunity to share valuable environmental management lessons is likely to change that perception.

Cooperation and information sharing take on even greater significance when waste management is used in response to a catastrophic spill. Under federal law, chemical and oil companies must have the facilities



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**More than
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threat, a
catastrophic
spill or emission
requires easy,
fast access to
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information.**

to respond to such spills in a timely fashion. Since spills also tend to get a lot of press coverage, companies are eager to find effective ways to deal with them and minimize damage to the environment and their corporate reputations.

More than any other environmental threat, a catastrophic spill or emission requires easy, fast access to accurate information. The lack of such information could result in legal and financial trouble for a company as well as environmental devastation. Quick decisions involving hundreds of variables—from chemical reactions to equipment location and the weather—require huge amounts of data and an infrastructure able to manipulate it. For this reason, chemical and oil companies often create third-party membership-oriented groups that orchestrate cleanups and act as information clearinghouses.

One such clearinghouse is CHEMTREC, the Chemical Transportation Emergency Response Center, a part of the Chemical Manufacturers Association in Washington. CHEMTREC fields phone calls 24 hours a day, seven days a week, from workers and companies involved in chemical emergencies, answering questions on chemical makeup and volatility, health hazards and cleanup. In 1987 CHEMTREC was drowning in a sea of Material Safety Data Sheets, the forms chemical manufacturers fill out detailing the properties and hazards of each one of their products. "We had more MSDSs than we could reasonably access," said Jay Chezem, manager of National Chemical Response and Information Center Computer Systems. "We had thousands of them in binders, and it was taking our communicators anywhere from six to eight minutes to respond [to questions]. That's far too long." During a chemical spill, in six to eight minutes "somebody could get killed."

The paper system also required that the communicator leave his or her phone station. "We have multiple phone lines," Chezem explained. "Every time the phone would ring, [the communicator] would have to break off his search" to answer it.

CHEMTREC decided that it could better handle the 400 calls it gets a day if it put its 650,000 MSDSs and other paper records in an imaging system. And although the information on an MSDS is standard, the forms that individual manufacturers use are not, so a scanner helped to speed up data input. The imaging system has reduced the amount

of time it takes to access chemical information from minutes to seconds. This improvement is especially important in light of a recent Department of Transportation regulation requiring that all shippers of hazardous materials have access to 24-hour emergency services such as CHEMTREC. As a result of that ruling, the organization's registrations have jumped 80 percent in the last year.

Still in the formation stage, but pledged to respond to catastrophes in U.S. waters, The Marine Spill Response Corp. is working with Electronic Data Systems of Dallas to create a communications infrastructure that will operate on EDSNet, EDS's global network.

The MSRC was created by marine petroleum transporters to orchestrate cleanup and containment efforts at sea. In addition to its headquarters in Washington, it will have five regular offices and 22 warehousing and

How to Clean Up Your Act

Effective waste management is becoming a critical part of many companies' operations

Prudent management of environment, health and safety issues has become more than just a matter of good corporate citizenship, according to Kenneth S. Kamlet, an environmental consultant for A.T. Kearney Inc. in Alexandria, Va. New federal requirements governing disclosure, rapidly rising hazardous-waste disposal and cleanup costs, and recently intensified enforcement of environmental laws have given environmental compliance greater prominence in the boardroom. CIOs with an eye on corporate strategies increasingly need to understand environmental objectives as well. In addition, CEOs, environmental managers and corporate directors who wish to keep themselves out of jail as well as to maintain a competitive edge would do well to heed Kamlet's 10 commandments of corporate environmental management:

1. Manage off-site waste disposal by third-



CHEMTREC and similar organizations work as information clearinghouses during environmental emergencies, such as this oil spill in Arthur Kill, N.J.

staging sites around the country, each with the ability to respond to a spill the size of the Exxon Valdez disaster in Alaska's Prince William Sound in March 1989, according to

an oil spill, and you need to make some rapid decisions correctly."

Critical to the decision-making process is such information as the location of equip-

the MSRC.

"To do what we have pledged to do, to make a best-effort response to an event of this magnitude, requires the manipulation of an enormous amount of information in a very short period of time," said Steve Duca, vice president of external affairs and readiness for MSRC. "In most [business] IS applications, . . . you've got time to process the data and check it out. [But] you can't stop

**"You can't
stop an oil spill,
and you need to
make some
rapid decisions
correctly."**

—Steve Duca

party contractors with an eye toward future liability. Paying more today for proper waste management will save money by averting future lawsuits and liabilities.

2. Remember that proper on-site waste management is less expensive and less troublesome than corrective action mandated by the federal government to clean up contamination.

3. Beware of natural-resource damages. If you are currently discharging pollutants into surface waters or wetlands, even if the discharge is covered by a federal or state permit, you may wish to reconsider the practice. A damage claim for broadly defined "natural resources" can be brought against a company even after a site has been cleaned up to the government's satisfaction.

4. Practice integrated environmental management. Responsible management requires continuous tracking of diverse facilities and operations as well as a board-level mechanism for responding to problems.

5. Inventory waste streams. Accurate, complete information on pollutants released to the environment and in the workplace, as well as those present in consumer products, is important for environmental management and efficient monitoring of waste recycling and disposal. In addition, much of this information is now required by law to be reported to the EPA.

6. Be meticulous about renewing routine

air and water permits. Government agencies and citizens' groups are becoming more aggressive about pursuing civil and criminal prosecution against environmental violators.

7. Carefully investigate real estate transactions. Failure to verify the cleanliness of a site prior to purchase—especially in this age of mergers and acquisitions—may saddle the new owners with substantial legal liability should the site be found to be contaminated.

8. Don't get bogged down in wetlands. Federal law prohibits wetland filling without difficult-to-obtain permits, and some states' wetland-protection laws virtually prohibit filling altogether.

9. Proactively manage workplace process hazards. The failure of companies in high-risk industries to voluntarily implement proposed Occupational Safety and Health Administration rules—which will become law in the next 18 months—regarding workplace hazards may increase their legal liability in the event of a serious accident.

10. Use environmental compliance requirements as a means of gaining competitive advantage. A company may gain a competitive edge simply by responding efficiently and creatively to new regulatory requirements. Environmentally sound companies are often more energy-efficient, waste fewer materials, lose fewer workdays to industrial accidents and sell better in increasingly "green" markets.

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ment and people; the names of smaller, regional cleanup cooperatives; data on the spilled substance; tidal patterns; wildlife that might be threatened by the spill; and the location of the most environmentally sensitive beaches. A decision-support system ultimately will allow MSRC to factor in such uncertainties as the weather and current.

In addition, according to Jay DePew, the account manager for EDS, the system will link to already existing databases of information from such groups as the Coast Guard, the EPA and Lloyd's of London. "Other groups have pieces of what we have," he said. "We're not going to reinvent the wheel." MSRC and EDS plan to have the system up and running by mid-1993, at which point it will include on-site command control centers, satellite links and mobile phones for beach cleanup crews. Such processing will require a tremendous data- and voice-transmission capability, DePew pointed out. MSRC's decision to go with EDS was based on the idea that "you don't want to build that capacity and have it sit there all day long."

Despite the flurry of IT activity around environmental information tracking and gathering, companies are still not very good at it or very organized about it, according to Marilyn Schule, a vice president in the Environmental Health and Safety practice of A.T. Kearney, a consulting company in Alexandria, Va. Corporate databases are often limited to individual facilities, and central reporting still involves making sense of many paper reports. For example, Monsanto's chemical and agricultural divisions report separately to Redington, who makes his analyses literally with paper and pencil. Monsanto is planning to integrate its databases, but in the meantime, "what you lose is specificity," Redington said. "You lose the depth of the data."

Under the Clean Air Act recently passed by Congress, according to Kenneth S. Kamlet, a principal at A.T. Kearney, "there will be even more of a premium on integrated environmental management because there are more explicit trade-offs now than there have been in the past. [See related story, Page 60.] It used to be that someone who



INCREASINGLY, environmental concern makes bottom-line sense.

was concerned about contaminants from landfills could switch to incineration and not worry about air pollution. [But] you can't plug one point of release without knowing what effect that's going to have on the others."

The Clean Air Act requirement that companies be evaluated on the basis of total emissions means that "a decentralized company can quickly find itself

in trouble if people who are responsible for these activities act without regard for the [whole] company," Kamlet said.

In addition, said Schule, such integrated information is extremely useful to companies that are trying to make a long-term environmental plan to pinpoint areas ripe for source reduction of pollutants.

Kamlet agreed. "Particularly for a company that is large, diversified and, to some extent, decentralized, . . . it's important that there is some form of centralized environmental tracking system," he said. Still, he admitted, "if a company had enough experienced people and could be sure that those people were going to stay with them forever, I suppose they could rely on a [manual] approach."

As environmental responsibility becomes more of a corporate concern, the environmental manager is more and more likely to be an environmental vice president and to report to the CEO or COO. Thus, with the growing importance of IT in the quest for environmental acceptability, the environmental vice president and the CIO have a greater likelihood of forming a strategic bond in what is now largely a tactical undertaking, said Stephen Poltorzycki, a director in the Environmental Health and Safety practice at Arthur D. Little, a consulting firm in Cambridge, Mass.

Whatever the difficulties of collecting and integrating pollution information, manufacturers are likely to keep at it because responsible environmental management is fast becoming mandatory. "It used to be that if you didn't know about something, you could not be held responsible if a problem occurred under your watch," said John S. Willson, another EHS director for Arthur D. Little. "Today, such a safe harbor is far from certain." □

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TO EACH ITS OWN

BY KATHLEEN MELYMUKA

Cooperative processing
lets organizations with
mixed hardware platforms
put the computing burden
where it's borne most
efficiently and the
information where it does
the most good

Most of the computing world—anyone running linked mainframes, minis and PCs—is probably spending more time, money and processing power than it needs to and getting less integration and ease of use than it should. Cooperative processing can change all that.

Cooperative processing can cut host resource costs by as much as 60 to 80 percent and substantially reduce communications costs as well. It can replace crowded, monochrome 3270, AS/400 and VAX screens with a single, colorful, graphical, user-friendly, PC-like interface. That single interface can provide simultaneous, user-transparent access to every essential corporate system while providing for the control, integrity and maintenance of every corporate PC. Cooperative processing is the technology of tomorrow, but companies can start putting it in place today.

Cooperative processing means processing different parts of a single application on different computers to make the best use of the processing power of each. It is not a new idea, but it's an idea whose momentum depends upon a critical mass of host-based PCs, which only recently has been achieved. "Cooperative processing has been used with programmable workstations for 10 years or longer, but the dominance of some PC architectures has delayed its broad use," said Allen A. Kalkstein, a partner in the Chicago-Great Lakes management consulting regional office of Ernst & Young, which is currently implementing cooperative processing systems for large corporate clients (see related story, Page 70).

Kalkstein explained that the explosion of stand-alone PCs in the '80s and the ensuing rise of departmental computing put cooperative processing on hold until recently. Today, a large installed base of PCs hooked to hosts, a new understanding of the limits of departmental computing, and IBM's SAA announcements all are pointing to cooperative processing as the fu-





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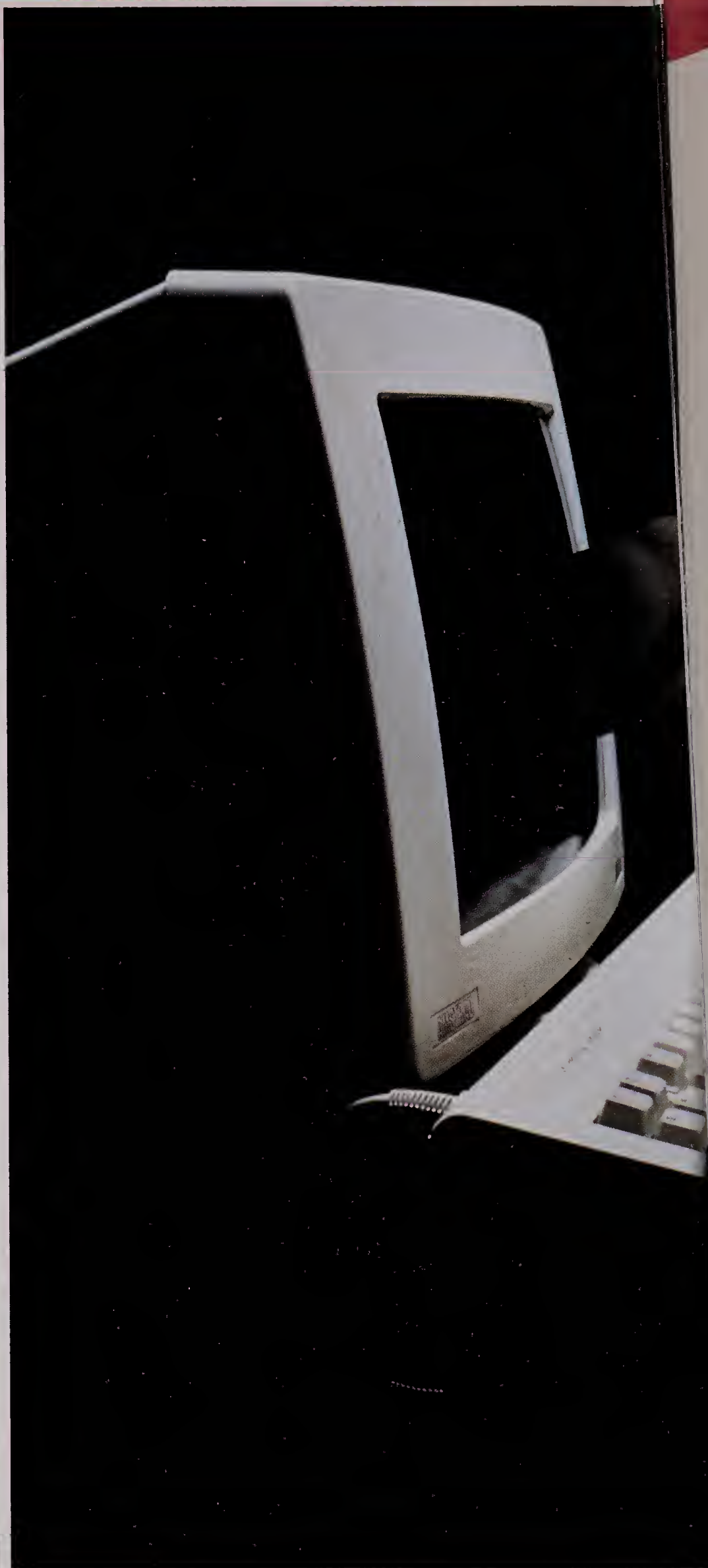
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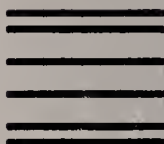
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Tandon

ture of computing.

Cooperative processing makes the most of an organization's computing power and investment in hardware. "Most people using host-based applications on the PC are using a PC as a dumb terminal," said Philip Carpenter, product manager for Mozart Systems Corp. of Burlingame, Calif., a maker of cooperative processing tools. "That is not a strategic way to take advantage of the PC. They are powerful little beasts."

"The biggest reason for cooperative processing is economics," said Douglas Engle, product manager of Vision 2000, a collection of cooperative-processing products designed to enhance management productivity for Software 2000, based in Hyannis, Mass. "The mainframe is very expensive from a human-resources standpoint. It can take 30 people just to operate a mainframe. The PC is low-budget equipment, and the people are already there. Everything you can pull off [the host] and put on little boxes gives a higher return on your

"Most people using host-based applications on the PC are using a PC as a dumb terminal. That is not a strategic way to take advantage of the PC. They are powerful little beasts."

—Philip Carpenter

investment."

With mainframe MIPS running around \$150,000 each and PC MIPS below \$1,000, the economics are clear, said Stephen Sayre, vice president of marketing for Easel Corp., a

Woburn, Mass., maker of cooperative-processing tools. "It's an order of magnitude differential," he said. "Of course, a CIO will tell you that a MIPS is not a MIPS is not a MIPS, but when the smoke clears, if you're off-loading from mainframes to PCs you're going to save hundreds of thousands—if not millions—of dollars over your investment horizon."

Cooperative processing combines the best of the mainframe and PC worlds. The PC can provide colorful, user-friendly graphic interfaces, editing, data validation and a good deal of local processing. The host is reserved for big-guns number crunching and integrating PC transactions into larger corporate systems. Because as much processing as possible is done at the PC, expensive mainframe cycles are replaced by cheaper PC cycles, and less interchange of data means lower communications costs. "The more you can offload to the PC, the more money you're saving," said Mozart Systems' Carpenter.

Begin with an Interface-Lift . . .

The screen is the logical place to start in a three-phase implementation of cooperative processing

Cooperative processing can be implemented in three phases, starting with the front end, according to Allen A. Kalkstein, a partner at Ernst & Young, a New York-based consultancy that helps large corporate clients develop cooperative-processing systems. "Users want functionality and ease of use, so you start with what we call

3270 beautification. You look at the old boring screens and enhance them with color, pop-up menus and [context-sensitive] help. You take one screen and parse it out to multiple screens; take multiple screens and put them together according to the way work is done."

But true cooperative processing is more than just putting on a pretty face. "In 3270 beautification," said Kalkstein, "you're still dedicated to the mainframe. If it goes down, you go down."

So the second phase, according to Kalkstein, involves "exploit[ing] a full-blown peer-to-peer cooperative-processing environment. You want to delegate as much processing as possible and make it stand alone on the PC." For instance, a marketing application in a company with dispersed sales offices would bring the enhanced mainframe application to the field-office PCs. The field personnel can work on it without any

connection to the mainframe, exchanging information with the host only as needed.

Only when the business is completed and it's time for other members of the corporation to act on it do you transmit it and interface with the mainframe applications. "You want to use the mainframe as a central database and repository," said Kalkstein. "You want to allow extensions of the organization the freedom to act as independently as possible."

The final phase is control. "You've got to maintain and control versions of software and related data sets that run on the PC," Kalkstein explained. His solution is distribution software that transmits new applications, releases, tables and documents to be sure everyone is in sync. "Without those three pieces, cooperative-processing solutions will only be partially useful to an organization."

—K. Melymuka

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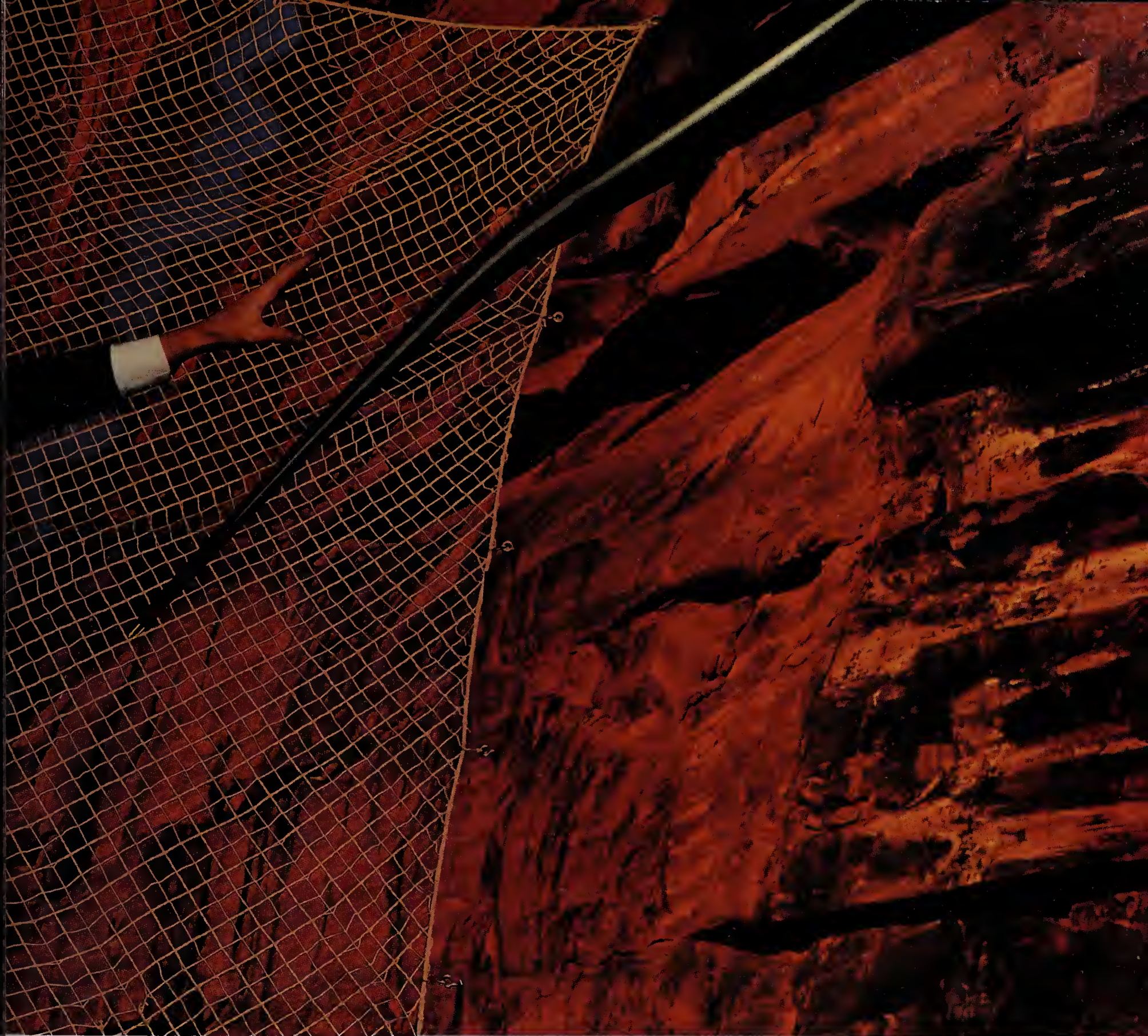
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Cooperative processing also reduces training costs, since the single, common user interface provides the same look and feel to each application, allowing simultaneous, user-transparent access to a range of mainframe or mini hosts from the PC. Using a tool such as Mozart, for example, you can pull data from 3270s, AS/400s and DEC VAXes simultaneously. "The user has no idea this is even going on," said Carpenter. "Before, you would have to know where the data is, log onto each different machine, write down the data and log off. Now you don't have to know or care where the information is."

The logical place to start cooperating is with the user interface. "You don't want a \$5 million box doing

"Personal computing won't be personal anymore. Personal computing will be a part of enterprise computing. The days of islands of information are being eclipsed."

—Stephen Sayre

something a PC is designed to do," said Engle. "Machine cycles get soaked up in the display process. You're sending machine cycles back and forth saying, 'Now the display looks like this. Now the display looks like this. . . .'"

Cooperative processing tools such as Infront by Multi Soft Inc. (Lawrenceville, N.J.), Mozart by Mozart Systems Corp. and Easel by Easel Corp., enable developers to construct user-friendly front ends to mainframe programs. Since the front ends intercept the terminal data stream sent by the host, they look to the host like a dumb terminal, and no changes to mainframe code are required. Such tools commonly include a third- or fourth-generation language, a screen-development tool, a

Anatomy of an Implementation

.....

A much-needed resystemization effort gave one company a good excuse to test the benefits of cooperative processing

At Comdisco Inc., marketing drives business, and a jerry-rigged system of PCs linked to the mainframe was driving the marketing department crazy. The Rosemont, Ill., company buys, sells and leases high-tech equipment, so when the inefficient system threatened to swamp sales in 1987, Ron Markham, hired to build a central corporate database, became the cooperative-processing guru by default.

The sales-support system was complex and difficult to learn—a

mishmash of automated and manual processes, many of which were redundant. For example, a purchase leaseback transaction could involve any of 300 kinds of paperwork depending on terms. A user might have to enter the same information as many as 23 times for one transaction.

Markham realized that cooperative processing might provide a solution to this paperwork morass. "It was a classic example of a business need driving the technology rather than the other way around," he said.

Markham chose Infront, a cooperative-processing tool from Multi Soft Inc., of Lawrenceville, N.J. "They were essentially selling a 3270 beautification product . . . [in which] you take a CICS application, run Infront on PC emulation, capture the mainframe screen and map it to a user-friendly screen on the PC, so you'd get pop-down menus, color, graphics, editing. That's not true cooperative processing, but we built the first marketing application using that technology."

Markham built a classic mainframe application and put Infront on the PC as the user interface. "It was totally dependent on the mainframe," he explained, "but we got a feel for the

product, marketing got a feel for the types of screens, and we started working toward a real cooperative-processing application."

The intended users demanded that the new system reduce the training curve drastically. They wanted no user manual. Although it would be necessary to use information from the corporate database, they wanted to be able to do work if the mainframe or the network went down. They wanted to continue to use WordPerfect, their word processor of choice. They wanted high productivity.

The team built in context-sensitive tutorials to guide users and a tree structure that minimizes decision-making by automatically bringing up the proper forms triggered by the information entered by the users.

Customer information stored on the mainframe is now also stored on the PCs of the appropriate salespeople, so users needn't access the host. If a support person logs on and the mainframe is down, he or she can still generate a contract. The PC stores the appropriate information until the mainframe goes up, then passes it on for integration with other corporate systems.

communications tool and a software-distribution tool. These can assist developers in shifting processing tasks from the mainframe to the PC, but that's the tricky part. "It's a fundamental rethink of how you build applications," said Easel's Sayre. "Instead of building skyscrapers, you're building one-story modular structures on a million square feet of land. You've got to figure out which part of the application belongs where."

Design isn't the only problem. The immaturity of cooperative processing presents its own challenges. "It's a new technology, so there will be some of the same problems you get with new software," Kalkstein explained. "Releases may not be fully ready. It's like the late '60s and early '70s [when current mainframe tech-

*Cooperative
processing is the
vehicle for bringing
computing to the
source of the
transaction, blurring
the line between
those inside
the organization
and those outside.*

One of the most difficult pieces was the design of a seamless interface between Infront and WordPerfect. "That was tough," said Markham, but with help from Multi Soft, WordPerfect and the consulting team, it finally came together.

With 200 PCs at 23 offices throughout the U.S. and Canada, Markham knew that control of the system was crucial. A software-distribution facility runs on the host and the PCs, controlled by a master PC at corporate headquarters. "Anything new goes to the master PC, and it's uploaded to the mainframe for distribution to the [rest of the] PCs," said Markham. "When a user logs on, the PC automatically goes to the host to see if there's anything new. It's all transparent to the user."

All of this didn't come easily. "We used a lot of outside help to get people up to speed on the technology," said Markham. "[Consultants from] Ernst & Young put together the basic infrastructure. It's a manpower-intensive technology."

Being a pioneer in a technology brings its own set of problems. "The Infront product wasn't all that mature, but it was still the best thing out there," Markham recalled. "They

were thin on quality assurance so we had to watch for land mines. We developed a very structured programming environment with a lot of rules and quality-assurance checks. We also kept a high-level view of the product we were trying to build, so if we were wrong, at least we were consistent and we could change it later across the board."

Multi Soft recently released a new version that addresses many of the issues with which Markham's group struggled. "We tested a lot of code for them," he chuckled. When the first system was ready to run, Markham faced another hurdle. "We had problems with performance because of all the layers of software we had put together," he said. "The XTs were just too slow. We had to upgrade them with '386 processors to make it a useful product."

Markham's group has completed three major products and expects to complete a new one each month during the coming year. Reaction to the products has been intensely positive. "Usually you expect resistance to a new system," said Markham. "The only complaint we get is that it's frustrating for them to wait for the rest."

—K. Melymuka

nology was in its infancy], not like the maturity of [today's] mainframe environment. In a way we're slipping back to a period where vendors are less sophisticated."

Since the technology is new and the products are still somewhat immature, most implementations depend on outside help. "It's not as simple as vendors would like to portray it," admitted Sayre. "It's a new architecture. Developers will have to take a lot of baby steps in the beginning. Distributing the interface is a good baby step to start with, [but] the typical sale involves consulting."

Despite the problems, experts agree that the benefits of cooperative processing are worth it. Ultimately, they say, cooperative processing will change both computing and business. First, it will erase the line between personal computing and enterprise computing in organizations. "Personal computing won't be personal anymore," said Sayre. "Personal computing will be a part of enterprise computing. The days of islands of information are being eclipsed."

More important, cooperative processing is the vehicle for bringing computing to the source of the transaction, blurring the line between those inside the organization and those outside. "Many companies are trying to put data entry at the source so the customer can create and access his own data whenever he wants," said Gerry Jurrens, vice president of Multi Soft. "[Cooperative processing] cuts out the middleman."

With its dispersed computing and central control, cooperative processing will enable more and more organizations to move toward this model. "Cooperative processing is here, and it's the wave of the future," said Peter Keen, executive director of the International Center for Information Technology in Washington. "First you need cooperative business processes. Cooperative processing is the architecture to support that. This is going to be the most important issue in the '90s." 

Kathleen Melymuka is a freelance writer based in Duxbury, Mass.



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Oops... My Luck Ran Out

Just when you think
you're on top of the
world, think again

BY TRIPP STRANGE

Longtime readers of CIO may recall that we ran a First Person column two years ago ("O, Lucky Man," April 1989) by one Tripp Strange, a self-described "CIO who has everything." Well, make that HAD. As Mr. Strange now reveals in his First Person return engagement, all glory is fleeting. . . .

I owe the world an apology. Maybe that's putting it too strongly. But I have reread many times the article I wrote two years ago, and it now makes me want to buy up and destroy all existing copies of that particular issue of *CIO* so that no one else will be made to suffer through the obnoxious drivel I once had the nerve to imagine would look well in print.

Live and learn. I probably richly deserved the many bad things that have happened to me since then. So

consider this piece my penance. Here I set right old wrongs by giving readers the satisfaction of learning what befell a smug imbecile who thought that nothing could possibly go wrong. . . .

In fact, however, even before that first article was printed I had suffered my first, unaccustomed, reversal.

As CIO of Threshold Industries Inc., I perhaps paid too much attention to cultivating my closeness to the chief executive and too little to cultivating appropriate technology. I fell for all of the alleged advice I heard at those late-1980s conferences: that there was too vast a gulf between withdrawn, unsociable systems people and convivial business people, and the best thing a joe like me could learn was not DASD or FDDI but golf. Of course, there was nothing wrong with the problem statement; it was the proposed solution that sunk me. So there I was, talking famous Scottish water hazards with the boss while my systems developers were behaving like profligate monks. Users would wander into the IS enclave, hoping to strike up a conversation, and would leave believing that everyone employed there had taken vows of silence. A joke that made the rounds in those days—Question: What's the difference between an airplane hijacker and a systems developer? Answer: You can negotiate with the hijacker.

It's not that the monks weren't busy. In fact, they were developing an \$850,000 order-entry system for the sales and marketing groups that no one in either group had actually requested. Apparently, someone just thought it was a neat idea. One of those someones was apparently me. A subsequent audit of the decision-making process turned up a series of detailed memos that I had robustly initialed, probably while distracted



with the task of selecting an appropriate graduation gift for the CEO's niece.

The system worked great. Unfortunately, not a single one of our customers or suppliers turned out to want or even need it. Imagine the sound of a good-natured "Oops!" escaping out into the cool air of the corner office. It is not a pleasant utterance. No amount of eager brown-nosing can fully redeem a screwup of this magnitude.

In the aftermath of this debacle, a kind of glee pervaded the executive council. To say that the ribbing I took was vicious might be an overstatement, but still I felt an unwholesome delight was taken in my diminished stature. CEO Phil Landridge opened one meeting by going around the table and asking each member present to inform me of the sorts of systems they very much hoped I wasn't developing for them. A good time was had by all.

I figured this was only a minor bump in the road. But soon enough the bridge was out. No doubt many readers are now amply familiar with Threshold's virus calamity (perhaps through my humiliating *Nightline* interrogation by Ted Koppel, in which I was forced to explain our lack of an established computer backup procedure—Ted: "I'm not an expert in these things, but isn't it considered a minimum performance standard to keep copies of important data?" Me: "Well, Ted, that all depends."). Among other bits of wanton mischief, the virus (actually, there were several) converted all of the English-based manufacturing specifications in our shop-floor systems to close (but not exact) metric equivalents. In the hydraulic-couplings business, close ain't good enough.

The absence of any sort of rigorous quality-control systems meant that it was several weeks before the damage was discovered. Many, if not most, of the errant products were shipped to customers; many, if not most, of those customers are now suing Threshold. Arrays of stern lawyers have questioned me at length, and under oath, about what I may or

may not have done to reduce Threshold's liability. These sessions have the flavor of my being measured for trussing and basting.

Furthermore, CEO Phil Landridge acceded to lawyerly urgings and allowed a polygraph expert to wire and interrogate all IS personnel in an effort to discover the viruser. For days a steady flow of enraged employees trudged slowly past my new, much smaller office (the kind of dreary, airless space where cartons of cafeteria paperware ought to be kept) on their

The system worked great. Unfortunately, not a single one of our customers or suppliers turned out to want or even need it.

way to complain (no more vows of silence!) to their new boss, CFO Teddy Hock, about being suddenly treated like terrorists rather than monks. To my knowledge, no culprit was ever found—though no one has yet interviewed me (ha-ha).

Teddy, whose office I happily conquered and occupied after schmoozing my way into Phil's affections, finally won it back, without U.N. assistance. In the aftermath, I got myself a strange (no pun intended) new title: Application Development Backlog Manager. And Teddy took over sole responsibility for IS, which is quite a distinction for someone of Teddy's quite limited abilities. Instead of Teddy reporting to me, I now report to him.

So far there has been little enough to report, since Teddy has clapped a moratorium on all new application development. The backlog has shrunk to nothing in the meantime, and there is talk in the air of the "O" word—outsourcing. Phil spends a lot of time congratulating Teddy on the reassuring lack of IS activity. Cus-

tomers (at least those not currently suing us) are reportedly happy that their relationships with Threshold have resumed a pleasingly familiar homeostasis. They are happy too, of course, to know that our products meet their specifications again.

Have I left anything out? Oh, yes . . . the consultant. Teddy Hock convinced Phil that we needed "philosophical underpinnings" for our planned retreat from information technology. So he got permission to spend stratospheric hourly sums on the chic advice of Cornell Downs, the leading technology deconstructionist of his age. Mr. Downs, who both dresses and drives the part of less-is-more (blue-light-special synthetics from K mart, a battered Summer-of-Love-style Volkswagen bus), arrived here only last month with his staff of one, a dour pencil-carrier named Helga something.

Cornell specializes in staring either into the middle distance or rivetingly into the eyes of whomever he's pretending to listen to. Then he's apt to nod brusquely and utter something that sounds like it was written by the Dalai Lama before asking Helga to go sharpen his pencil. For the past three weeks I've watched Teddy squiring this pair around, and I can tell that the outsourcing die is cast. Teddy looks so happy.

The monks walk past my office and stare in disconsolately, knowing that I am not to be spoken to but wishing that I could make their pain go away by happily initialing some needless waste of Cobol into existence. They long for the good old days of monastic industry. The lucky ones will end up working for the outsourcer. The rest will probably move in here with me and the cafeteria straws.

Lessons? Here's one: Just when you think you've covered all the bases, they add another base—which turns out to be explosive. Here's another: Don't write glib columns for CIO. ☐

Former CIO Tripp Strange is Application Development Backlog Manager for Threshold Industries Inc. of Pensacola, Fla.

New-Age Venture Capital

When it comes to technology investment, telecommunications and software are where the money is

BY DON GOODING

Where will the next waves of information technology innovations come from? If past is prologue, they are likely to come from the ranks of entrepreneurial companies backed by venture capital. Over the last 30 years many of the great companies leading the way in important new areas—DEC in minicomputers, Rolm in digital PBXs, Apple and Compaq in microcomputers (to name but a few)—have been helped along the way by professional venture capitalists.

Recently, venture capitalists have been emphasizing software and telecommunications over semiconductors, computer hardware and peripherals. What are the buzzwords cum markets for the next decade?

Fiber to the Outlet: Entrepreneurs will help drive the rollout of next-

generation fiber networks—FDDI (for example, Synernetics), SONET (Transwitch), fiber to the home (Broadband Technologies, Raynet) and ultimately broadband ISDN.

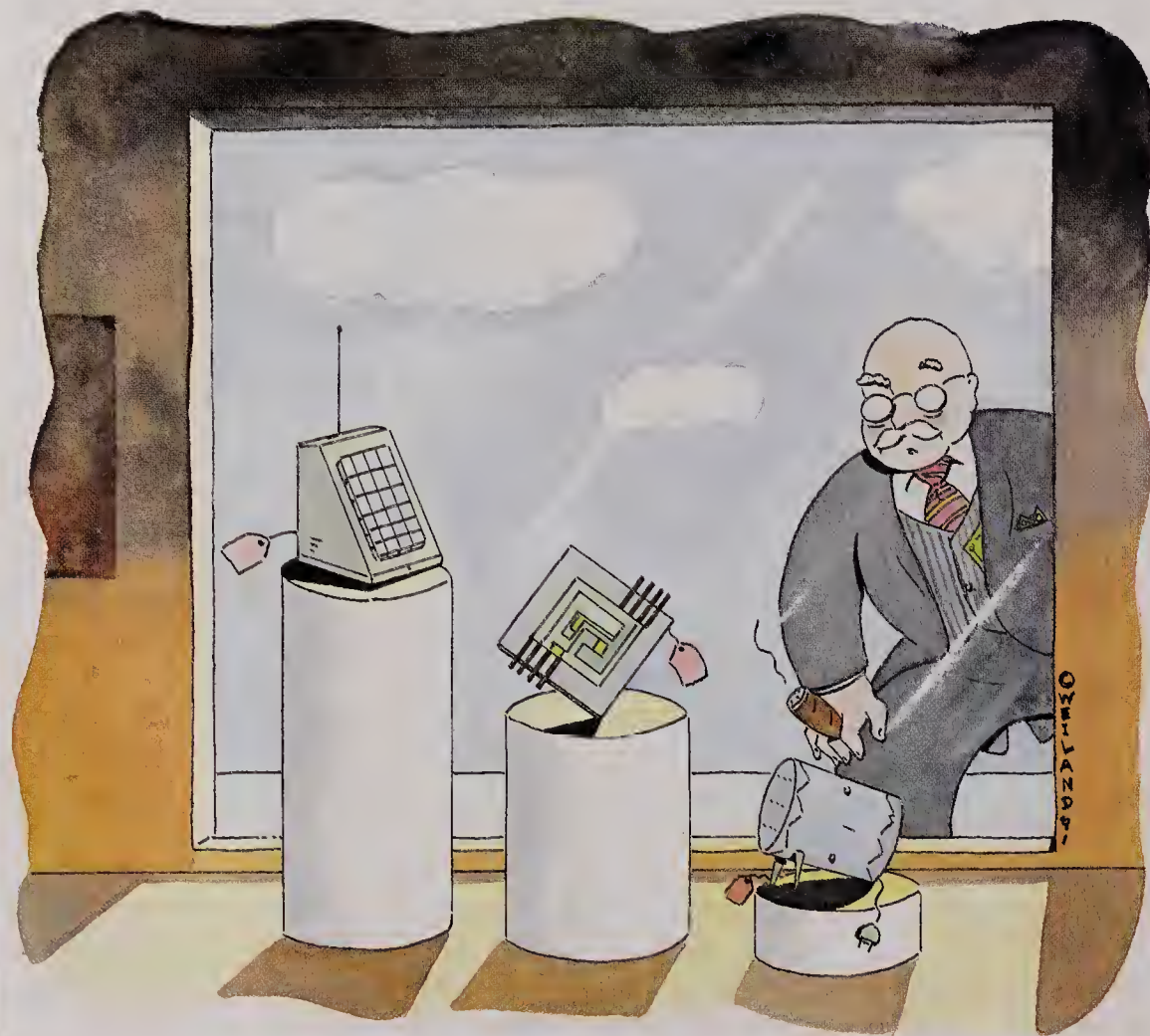
Image Communications: One of the major growth areas for the 1990s, image communications opportunities include standardized full-motion video (Compression Labs, Picturatel), facsimile processing (Audiofax, OAZ), document image transfer and multimedia communications.

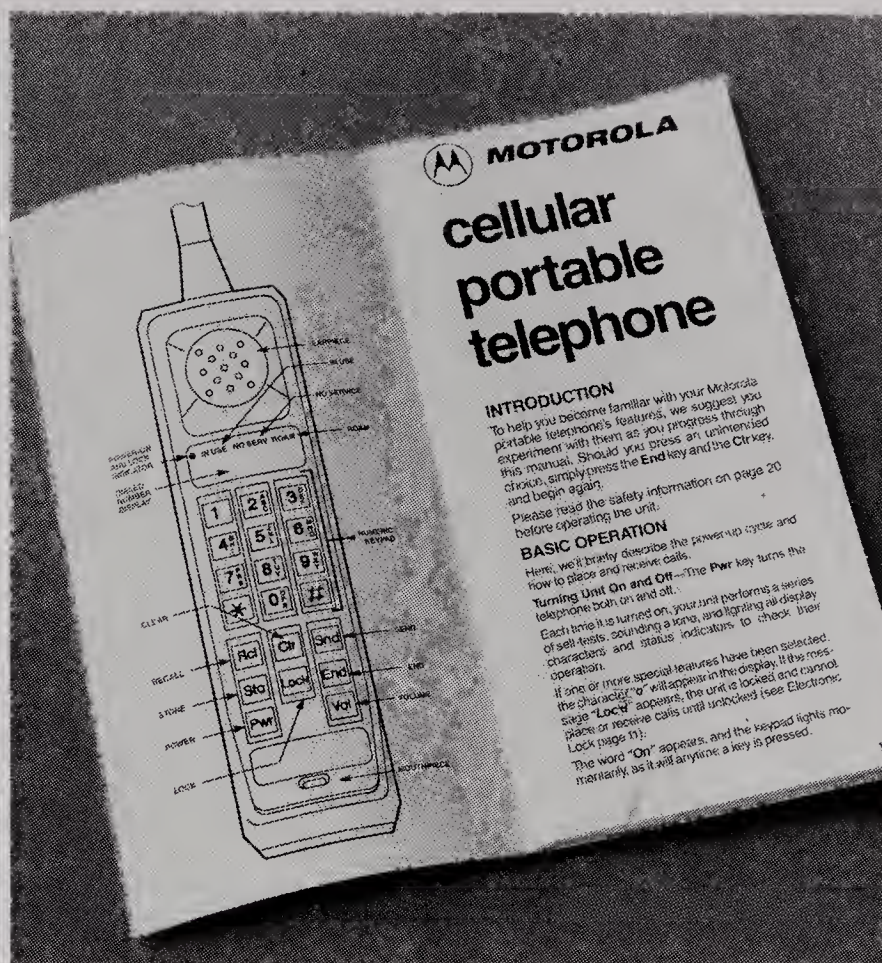
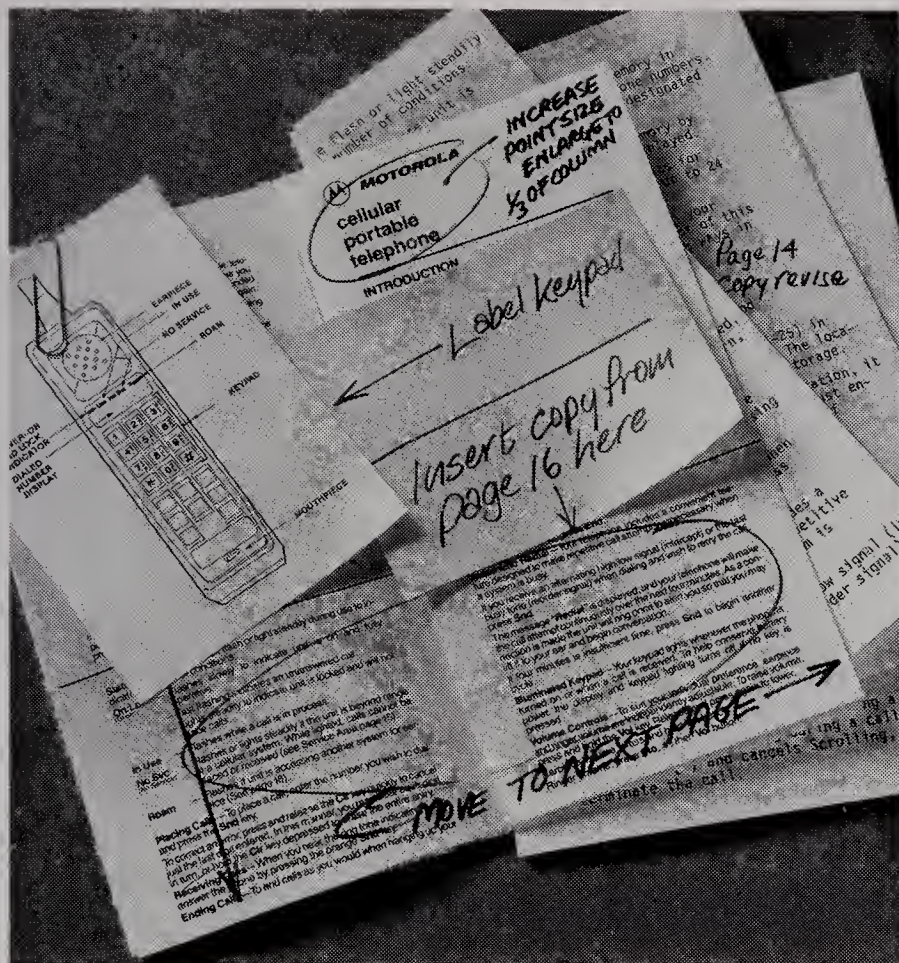
Personal Communications: The market for nationwide cellular and paging (Skytel, PageMart) is growing like crazy. A European import, the Personal Communications Network, threatens competition. PCN could be a boon for entrepreneurs if spectrum allocation issues are ever resolved, or if spread-spectrum technology can develop to fill the needs within existing frequency allocations.

Wireless Data: Through cellular modems (Cellular Data), mobile data dispatch (RAM, Racotek), laptop computer communications, automatic vehicle location (Qualcomm) and wireless LANs (WINDATA), the wireless data revolution offers significant productivity gains for mobile workers. However, users will need to sort through a range of options that today cross a broad range of pricing and features.

Computer Integrated Telephony: Implementation of standard PBX/ACD to computer links (Aristacom), voice response to database connections (Syntellect) and computer control of public intelligent network capabilities (Unifi) will provide the applications necessary to drive the long-awaited integration of voice and data.

ISDN: The rollout of “narrowband” integrated services digital network in the early 1990s, driven by both strategic corporate applications and cost





Motorola wrote the book on cellular phones. A Xerox system lets them rewrite it in minutes.

Motorola is the world's largest producer of cellular phones. Not to mention cellular phone manuals. For which they turn to a company called Rich Graphics.

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savings (Aspect, Teleos), will set the stage for the design and testing of broadband ISDN in the late 1990s.

The software industry came into its own in the last decade. Microsoft, Lotus, Aldus, Autodesk and others have shown the investment community the value of a software franchise. The trends that helped create new opportunities continue, with new ones emerging.

Free Hardware: Developments in semiconductors and RISC processor designs continue to accelerate computing price performance improvements, allowing "new" software technologies to develop—graphical user interfaces, expert systems, image processing, object-oriented programming—on the basis that incremental MIPS are essentially free.

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CIO

VOLUME 4, NUMBER 7

COVER STORY

Deposits and Withdrawals

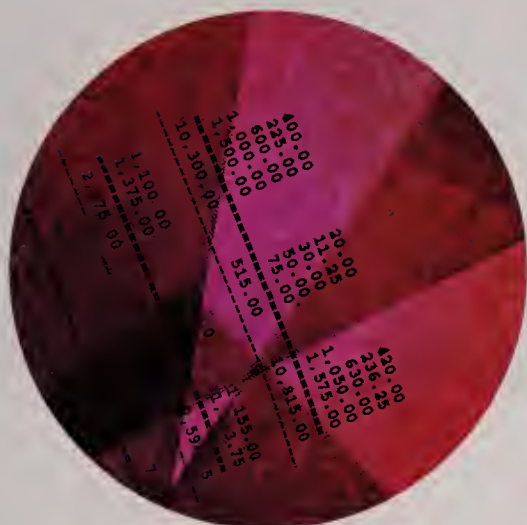
On balance, IT has made powerful contributions to banking, but the current dire climate has forced bankers to concede that technology is no substitute for sound business decisions.

By Thomas Kiely

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*A new balance for IT 42
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The image of efficiency 32

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The Sharper Image

Organizations are combining imaging with other technologies and systems to solve highly focused business problems.

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The Greening of the Bottom Line

Businesses are beginning to realize that the free and effective flow of information is a critical factor in dealing with increasingly stringent federal standards for managing toxic substances.

By Meghan O'Leary

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To Each Its Own

Cooperative processing lets organizations with mixed hardware platforms put the computing burden where it's borne most efficiently and the information where it does the most good.

By Kathleen Melymuka

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Divide and conquer 66



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Okay, so it won't exactly be Tyson-Holyfield, but The Computer Museum's 3rd Annual Computer Bowl still promises to be one of the most exciting quiz games you'll ever witness. Join us ringside for round after round of mind-boggling action as the finest minds in the East and West go head to head.

See who ends up on the ropes first. See who beats whom to the punch. But, most important, see who's left standing when all is said and done. The place: The San Jose Convention Center, San Jose, CA. With live broadcast via satellite to The Computer Museum in Boston. Don King, eat your heart out.

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Dr. John A. Armstrong
*International Business
Machines Corporation*
James E. Clark
*AT&T Computer
Systems*
Samuel H. Fuller
*Digital Equipment
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John Markoff
The New York Times

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T/Maker Company
Dave House
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Radio Shack
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*Borland International
Inc.*
David E. Liddle
*Metaphor Computer
Systems*

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Pat Collins Nelson and
Dr. Dave Nelson

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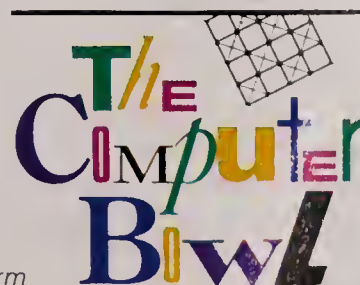
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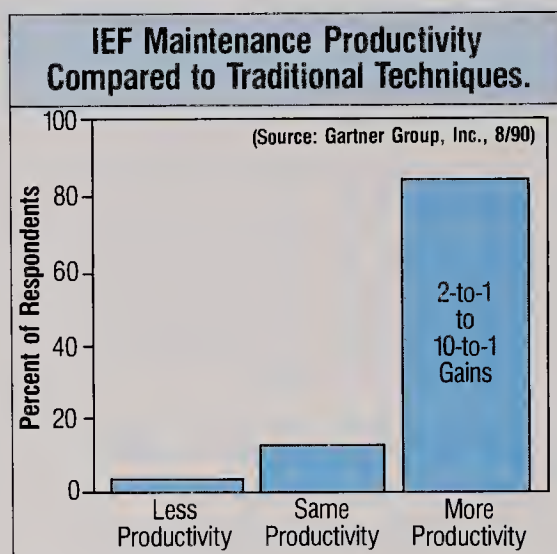
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follow. We are committed to increased environmental independence in support of the Open Systems concept.

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"The strengths of the IEF are clear-cut. One obvious quality advantage is that application changes are made to diagrams, not code. This ensures ongoing integrity—the specification always matches the executing system."

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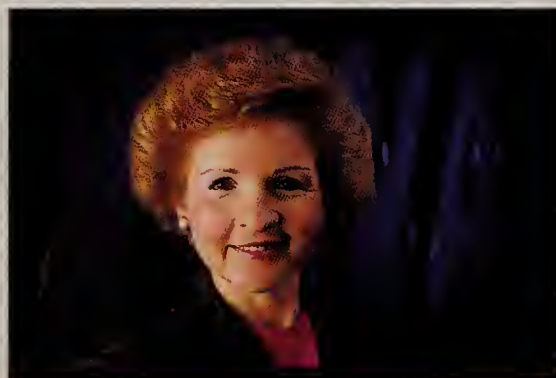
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Cloene Goldsborough
Director of Data Resource Management
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Chief Consultant
Nykredit (Denmark)

FYI

To Your Health

With an estimated 150 different strains of computer virus threatening systems everywhere, users would be wise to practice a little preventive medicine. Toward that end, TREND Micro Devices Inc. has introduced PC-cillin, an anti-viral software/hardware product that the company claims immunizes MS-DOS and LAN computer systems from known and future viruses. The product consists of a virus scan and a Terminate and Stay Resident filter with 12 "intelligent" viral traps. These traps analyze suspicious programs in RAM and screen them for certain characteristics common to viruses.

TREND calls PC-cillin the only anti-viral product that provides hardware protection against malicious boot-sector viruses by automatically storing crucial boot-sector data and partition-table information in an external EEPROM "hardware immunizer." If a virus causes the system's hard disk to crash, PC-cillin will download the isolated data and provide boot-sector damage recovery without system degradation. For more information call 800 228-5651.



Memorize This

Memory-hungry PC users may appreciate the newest addition to Intel Corp.'s line of memory enhancements—multi-megabyte modules that can be plugged directly onto the PC motherboard.

Intel's 72-pin Single In-Line Memory Modules (SIMM) are an alternative to add-in memory boards for users who would rather lodge fax boards, modems and other enhancement products in their expansion slots. Intel claims that in most systems, 2MB of SIMM extended memory will run memory-guzzling software such as Microsoft Windows 3.0 30 percent faster than a 2MB memory board. That may make SIMM the better choice for users looking for performance.

Users who run applications requiring expanded memory will need to add a LIM emulator, allowing the system to view extended memory as expanded memory. SIMMs are currently available only for select IBM, Compaq, Hewlett-Packard and Zenith computers, but Intel has plans to broaden its line later this year.

The retail prices of SIMMs are \$225 for 1MB, \$445 for 2MB or \$945 for 4MB. For more information, call 800 538-3373.

Building Blocks

Software Architecture and Engineering Inc. would like to do for application developers what modular construction technology has done for the home-building industry. The Arlington, Va., company says its new SNAP CASE toolkit does 85 to 90 percent of the application-building at the outset by giving developers data models, common database and network links, a graphical user interface and an expert-system shell in ready-made form. Users need only assemble these components and add custom features to come up with a finished product.

Software A&E says that SNAP is intended for use in preparing distributed applications that will be portable across hardware environments supporting Unix, C, X Window System, MOTIF and SQL open systems standards. Optional extensions cover OS/2, Presentation Manager, VMS and others. The \$28,000-and-up product will run on workstations from IBM, DEC, Hewlett-Packard, Sun Microsystems, Sequent and DG Avion. For further information, contact Software A&E at 703 276-7910.

Lapplications

Laptop computers have made it easy to get up and go, but portable computing can leave a lot to be desired in the way of connectivity, security and sound ergonomics. These concerns and more are addressed by 10 software products being sold together as one package, dubbed the FastLynx LapPack, by the Rupp Corp. LapPack, which



comprises products from seven different vendors, includes a file-transfer package, contact-management software, an automatic backup program, a hard-disk locking utility, a battery gauge, CompuServe's MS-DOS Software Pack, a cursor control and enhancement product and remote-control communications software. The complete package retails for \$299.95—a savings of more than 70 percent over the combined price of the products when purchased individually. For more information or to place an order, call 800 852-RUPP.

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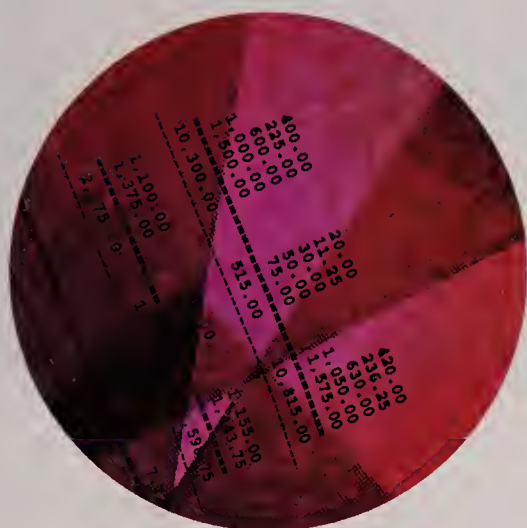
On balance, IT has made powerful contributions to banking, but the current dire climate has forced bankers to concede that technology is no substitute for sound business decisions.

By Thomas Kiely

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*A new balance for IT 42
Cover photo by Sonny Williams*



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The Sharper Image

Organizations are combining imaging with other technologies and systems to solve highly focused business problems.

By Paul Konstadt

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The Greening of the Bottom Line

Businesses are beginning to realize that the free and effective flow of information is a critical factor in dealing with increasingly stringent federal standards for managing toxic substances.

By Meghan O'Leary

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To Each Its Own

Cooperative processing lets organizations with mixed hardware platforms put the computing burden where it's borne most efficiently and the information where it does the most good.

By Kathleen Melymuka

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Divide and conquer 66



M O R E ► ► ►



Aside from the Persian Gulf, two topics that have been grabbing news headlines continually these days are the banking industry and the environment. While we've had no reports of CIOs on the war front, this month two of our articles feature some perspective on the green scene.

Although heralded as a massive spender on information technology, the banking industry, in retrospect, may become a textbook example of a classic mismatch between the use of information and the strategic needs of a business. Of course, those needs have changed drastically during the past decade as the industry has become partially deregulated. The competitive fallout has been horrendous. The U.S. General

Accounting Office reported 1,000 bank failures during the 1980s, with about two-thirds of those failing in the last three years of the decade.

In our cover story this month, "Deposits and Withdrawals" (Page 42), Senior Writer Thomas Kiely explores how CIOs are reevaluating IT in light of the new reality of the banking industry. Many bank CIOs report their companies are paring down product offerings, building revenue with fee-based banking services and using transaction information as a basis for decision support systems that assist banking executives.

Reporting from the environmental front, Senior Writer Meghan O'Leary in her article "The Greening of the Bottom Line," beginning on Page 54, found that companies are in various stages of creating information systems used primarily to track data on the emissions of hazardous chemicals that legally have to be reported to various public agencies. This information is being shared with environmental and community groups who can use it to devise solutions to abate pollution at the local level—activities the government hasn't the resources to undertake.

Lest we get too caught up with the weightier IT issues of the day, we should not forget that *CIO* is a magazine about people. To that end, our First Person column on Page 78 is a return engagement penned by once-exalted CIO Tripp Strange, whose tale of a stunning reversal of fortune will prove heartrending for CIOs embroiled in the politics of positioning themselves in the corporate management firmament.

Marcia Blumenthal



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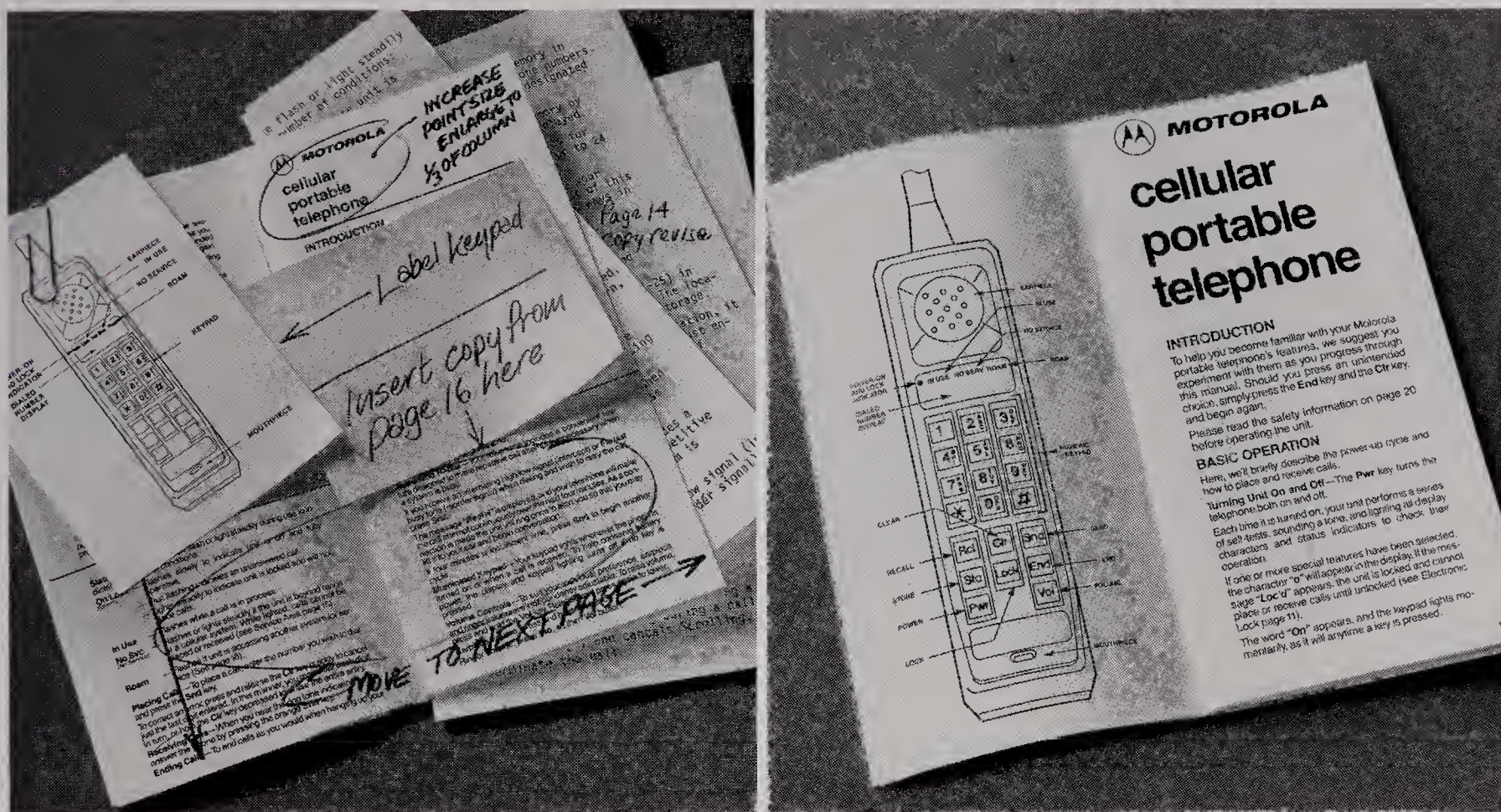
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Motorola is the world's largest producer of cellular phones. Not to mention cellular phone manuals. For which they turn to a company called Rich Graphics.

But when Motorola decided they wanted to be able to revise and reprint their manuals on a "just-in-time" production schedule, Rich Graphics turned to Xerox.

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Xerox workstation. Turnaround time is 80% faster. Costs are down 50%. And the documents produced are 99.99966% perfect.

Of course, Motorola isn't the only client that Rich Graphics uses Xerox for. And the resulting improvement in customer satisfaction has helped Rich Graphics double their printing business every year since they came to Xerox.

Which just goes to show that a partnership with Xerox can also help a company rewrite its bottom line.

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CONFERENCE CALL

QUESTION: *What are line managers in your organization doing to become more IT savvy? How are you helping them?*

Although IT has become strategically important, most CIOs have not mandated stringent training and education programs for their line managers. However, if help is requested, CIOs are more than willing to give management all the guidance it needs.

Dennis L. Smith

Chief information resources manager at the Veterans Affairs Medical Center in Beckley, W. Va.

“Line managers here mainly have someone within their department who is a liaison between us and them. So whatever managers learn, they learn internally through their own departments. We provide training as managers perceive they need it, and as we perceive they need it. For example, if managers felt that they needed training for an accounting application, they would tell us. But we would offer to help them if we determined that they needed help with an application like E-mail. We have a company policy requiring all managers to check their E-mail, and if they just leave it there, they probably don't realize some of the neat little things you can do with it. So we would try to hold an E-mail class especially for those managers.

“We have two different groups of managers. The managers who are really eager have a concept of what they can do with IT. These managers have extra access to their database files so they can format their own printouts or search for information. And then there are other managers who don't want to do any-

thing and who leave IT to the applications coordinator.

“We do have one or two managers who have learned things with just a little bit of help. But in the future we plan to have a class for managers for such things as designing reports and using information technology effectively.”

Paul Shearer

Vice president of corporate information systems for Massachusetts Financial Services in Boston

“We have a general policy of making computing power available to all levels of the organization, so our line managers have access to our computer facilities and PC-based tools. In addition, managers have access to corporate networking tools such as electronic mail, videotex and even 4GLs on minicomputers.

“As far as formal training is concerned, I have a group under me which is involved in training our managers to use PCs and the most frequently used tools and programs such as spreadsheets, database products and desktop publishing. We support both internal and external training, but for

the most part we like to keep the training in-house because we try to maintain a fairly rigid standard on the hardware and software that we use.

“Occasionally users will come to us with an idea or a suggestion regarding tools, programs or applications, but for the most part it's our department that initiates ideas and takes them to the users. We try to promote the standard use of the products we now have available.

“The line managers are quite receptive to computing because they realize the strategic benefits of using PC-based tools. The ongoing challenge that we face in the IS department is letting managers know how IT can enhance their own jobs and productivity without force-feeding it to them, as well as showing them how IT can be used in forming an overall strategy for the entire organization.”

Merle Ehst

Director of MIS at Boston Scientific Corp. in Watertown, Mass.

“This company does not have a formal strategy to promote IT as such, and I'm not working on putting one in place. Those managers that have an interest or a background in IT tend to drive the education or advancement on their own. However, I will help as needed by advising,

suggesting appropriate classes and coming up with a list of reading material.

“As in many small to mid-sized companies, the MIS department here just doesn't take the time to come up with a formal training plan. Most of the training that managers participate in is external, with a vendor or distributor (as in the case of the engineering department, which uses AutoCAD), or at a university in a class geared toward a specific application. Occasionally we have on-site training with Lotus, WordPerfect and Harvard Graphics, but again this is done when requested or needed by the end users.

“In my professional experience, managers will pursue training and education based on their interest. We're going through an age where most managers don't have an IT background, and it's difficult to push IT onto them. But as people come out of college and move up, they will have the background and they will be comfortable using everything from networking to PCs to mainframes.”

Readers are invited to suggest Conference Call questions. Contact Senior Writer Meghan O'Leary at 800 343-4935, ext. 4733, or by fax at 508 872-0618.



ILLUSTRATION BY PHILIP ANDERSON

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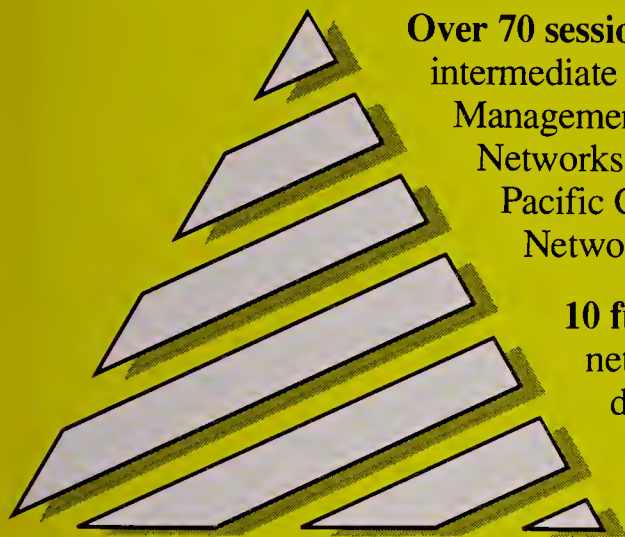
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EVENTS

Organizing and Managing the IS Business

Heritage Conference Center,
Southbury, Conn.
April 28-May 3
Center for Advanced Technology in
Telecommunications
212 477-4094

Designed specifically for IS managers, this conference uses case studies, authoritative presentations, exercises and interactive response technology to present the latest thoughts and techniques on IS issues. Topics include reshaping the business, repowering after downsizing and integrating planning processes. Registration fee: \$5,000.

Connectivity Day '91

Pulsations Entertainment
Complex, Media, Pa.
May 7
Real World Systems Inc.
215 358-3245

This conference is designed for users of local area networks and enterprise networks. User-to-user seminars, consultant forums and vendor product education seminars are presented alongside 65 hardware and software vendor exhibits. Registration fees: \$20 in advance; \$25 on-site.

The Hammer Sales, Marketing and Service Conference

Marriott Long Wharf Hotel,
Boston
May 13-15
Hammer and Company Inc.
617 354-5555

Exceeding customers' expectations is the theme of this conference. Topics include integrating operations across corporate boundaries, work transfer, interorganizational process redesign and value-added partnerships. Registration fees: \$1,100 to \$1,950.

Vision and Information Technology

University of California, Los Angeles
May 16
UCLA IS Associates Symposium Series
213 825-1879

This one-day symposium is designed for IS executives and general managers who concentrate on the areas of IS planning and IT architecture. Presentations from DuWayne Peterson of Merrill Lynch and Max Hopper of American Airlines highlight this event. Registration fees: \$150 to \$300 for complete program; \$75 to \$125 for evening only.

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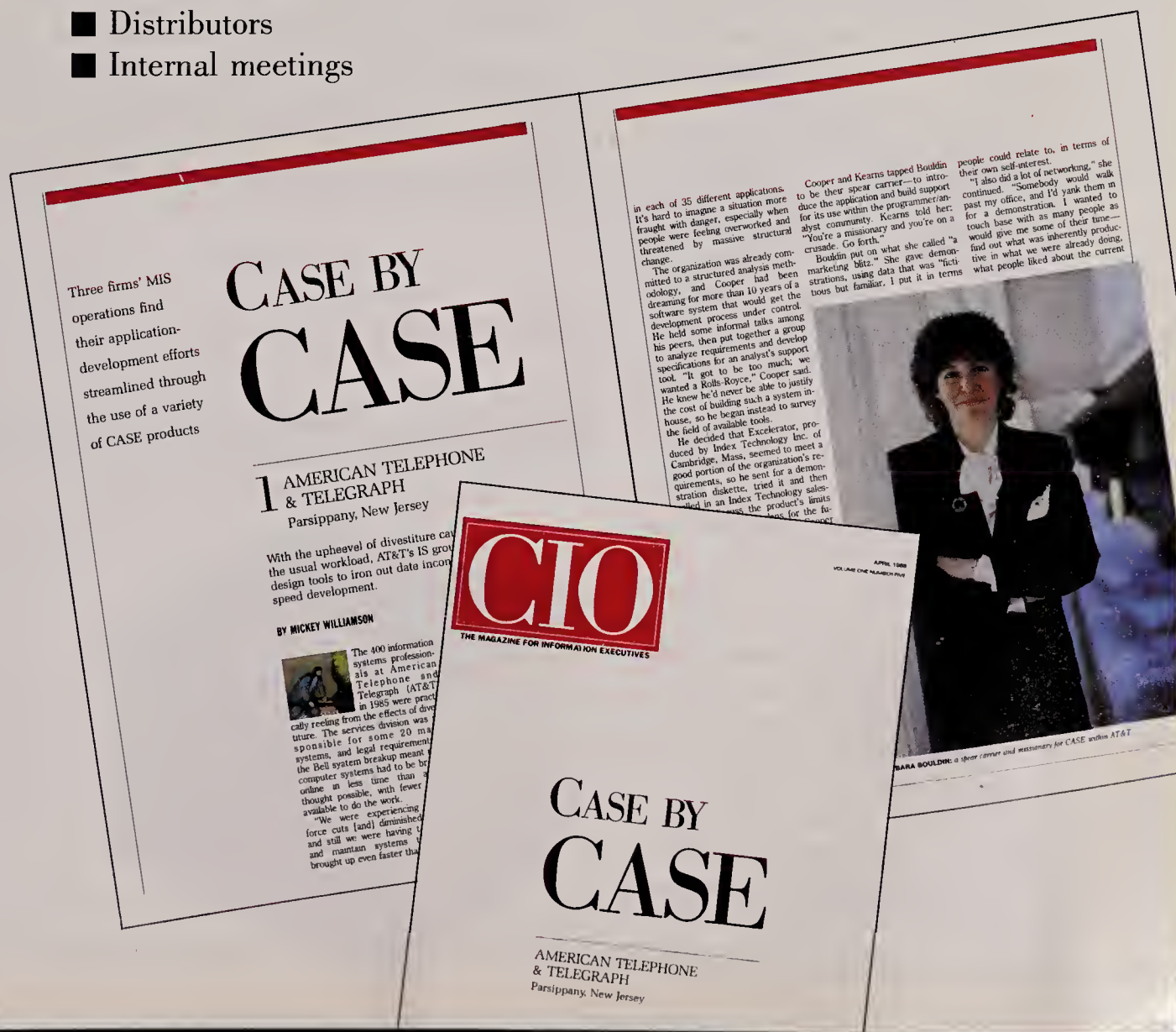
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To Your Health

With an estimated 150 different strains of computer virus threatening systems everywhere, users would be wise to practice a little preventive medicine. Toward that end, TREND Micro Devices Inc. has introduced PC-cillin, an anti-viral software/hardware product that the company claims immunizes MS-DOS and LAN computer systems from known and future viruses. The product consists of a virus scan and a Terminate and Stay Resident filter with 12 "intelligent" viral traps. These traps analyze suspicious programs in RAM and screen them for certain characteristics common to viruses.

TREND calls PC-cillin the only anti-viral product that provides hardware protection against malicious boot-sector viruses by automatically storing crucial boot-sector data and partition-table information in an external EEPROM "hardware immunizer." If a virus causes the system's hard disk to crash, PC-cillin will download the isolated data and provide boot-sector damage recovery without system degradation. For more information call 800 228-5651.



Memorize This

Memory-hungry PC users may appreciate the newest addition to Intel Corp.'s line of memory enhancements—multi-megabyte modules that can be plugged directly onto the PC motherboard.

Intel's 72-pin Single In-Line Memory Modules (SIMM) are an alternative to add-in memory boards for users who would rather lodge fax boards, modems and other enhancement products in their expansion slots. Intel claims that in most systems, 2MB of SIMM extended memory will run memory-guzzling software such as Microsoft Windows 3.0 30 percent faster than a 2MB memory board. That may make SIMM the better choice for users looking for performance.

Users who run applications requiring expanded memory will need to add a LIM emulator, allowing the system to view extended memory as expanded memory. SIMMs are currently available only for select IBM, Compaq, Hewlett-Packard and Zenith computers, but Intel has plans to broaden its line later this year.

The retail prices of SIMMs are \$225 for 1MB, \$445 for 2MB or \$945 for 4MB. For more information, call 800 538-3373.

Building Blocks

Software Architecture and Engineering Inc. would like to do for application developers what modular construction technology has done for the home-building industry. The Arlington, Va., company says its new SNAP CASE toolkit does 85 to 90 percent of the application-building at the outset by giving developers data models, common database and network links, a graphical user interface and an expert-system shell in ready-made form. Users need only assemble these components and add custom features to come up with a finished product.

Software A&E says that SNAP is intended for use in preparing distributed applications that will be portable across hardware environments supporting Unix, C, X Window System, MOTIF and SQL open systems standards. Optional extensions cover OS/2, Presentation Manager, VMS and others. The \$28,000-and-up product will run on workstations from IBM, DEC, Hewlett-Packard, Sun Microsystems, Sequent and DG Avion. For further information, contact Software A&E at 703 276-7910.

Lapplications

Laptop computers have made it easy to get up and go, but portable computing can leave a lot to be desired in the way of connectivity, security and sound ergonomics. These concerns and more are addressed by 10 software products being sold together as one package, dubbed the FastLynx LapPack, by the Rupp Corp. LapPack, which comprises products from seven different vendors, includes a file-transfer package, contact-management software, an automatic backup program, a hard-disk locking utility, a battery gauge, CompuServe's MS-DOS Software Pack, a cursor control and enhancement product and remote-control communications software. The complete package retails for \$299.95—a savings of more than 70 percent over the combined price of the products when purchased individually. For more information or to place an order, call 800 852-RUPP.

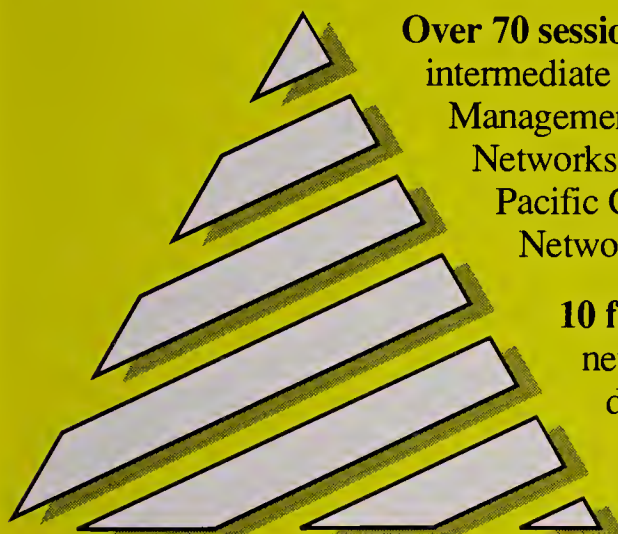


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EVENTS

Organizing and Managing the IS Business

Heritage Conference Center,
Southbury, Conn.
April 28-May 3
Center for Advanced Technology in
Telecommunications
212 477-4094

Designed specifically for IS managers, this conference uses case studies, authoritative presentations, exercises and interactive response technology to present the latest thoughts and techniques on IS issues. Topics include reshaping the business, repowering after downsizing and integrating planning processes. Registration fee: \$5,000.

Connectivity Day '91

Pulsations Entertainment
Complex, Media, Pa.
May 7
Real World Systems Inc.
215 358-3245

This conference is designed for users of local area networks and enterprise networks. User-to-user seminars, consultant forums and vendor product education seminars are presented alongside 65 hardware and software vendor exhibits. Registration fees: \$20 in advance; \$25 on-site.

The Hammer Sales, Marketing and Service Conference

Marriott Long Wharf Hotel,
Boston
May 13-15
Hammer and Company Inc.
617 354-5555

Exceeding customers' expectations is the theme of this conference. Topics include integrating operations across corporate boundaries, work transfer, interorganizational process redesign and value-added partnerships. Registration fees: \$1,100 to \$1,950.

Vision and Information Technology

University of California, Los Angeles
May 16
UCLA IS Associates Symposium Series
213 825-1879

This one-day symposium is designed for IS executives and general managers who concentrate on the areas of IS planning and IT architecture. Presentations from DuWayne Peterson of Merrill Lynch and Max Hopper of American Airlines highlight this event. Registration fees: \$150 to \$300 for complete program; \$75 to \$125 for evening only.

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CONFERENCE CALL

QUESTION: *What are line managers in your organization doing to become more IT savvy? How are you helping them?*

Although IT has become strategically important, most CIOs have not mandated stringent training and education programs for their line managers. However, if help is requested, CIOs are more than willing to give management all the guidance it needs.

Dennis L. Smith

Chief information resources manager at the Veterans Affairs Medical Center in Beckley, W. Va.

“Line managers here mainly have someone within their department who is a liaison between us and them. So whatever managers learn, they learn internally through their own departments. We provide training as managers perceive they need it, and as we perceive they need it. For example, if managers felt that they needed training for an accounting application, they would tell us. But we would offer to help them if we determined that they needed help with an application like E-mail. We have a company policy requiring all managers to check their E-mail, and if they just leave it there, they probably don't realize some of the neat little things you can do with it. So we would try to hold an E-mail class especially for those managers.

“We have two different groups of managers. The managers who are really eager have a concept of what they can do with IT. These managers have extra access to their database files so they can format their own printouts or search for information. And then there are other managers who don't want to do any-

thing and who leave IT to the applications coordinator.

“We do have one or two managers who have learned things with just a little bit of help. But in the future we plan to have a class for managers for such things as designing reports and using information technology effectively.”

Paul Shearer

Vice president of corporate information systems for Massachusetts Financial Services in Boston

“We have a general policy of making computing power available to all levels of the organization, so our line managers have access to our computer facilities and PC-based tools. In addition, managers have access to corporate networking tools such as electronic mail, videotex and even 4GLs on minicomputers.

“As far as formal training is concerned, I have a group under me which is involved in training our managers to use PCs and the most frequently used tools and programs such as spreadsheets, database products and desktop publishing. We support both internal and external training, but for

the most part we like to keep the training in-house because we try to maintain a fairly rigid standard on the hardware and software that we use.

“Occasionally users will come to us with an idea or a suggestion regarding tools, programs or applications, but for the most part it's our department that initiates ideas and takes them to the users. We try to promote the standard use of the products we now have available.

“The line managers are quite receptive to computing because they realize the strategic benefits of using PC-based tools. The ongoing challenge that we face in the IS department is letting managers know how IT can enhance their own jobs and productivity without force-feeding it to them, as well as showing them how IT can be used in forming an overall strategy for the entire organization.”

Merle Ehst

Director of MIS at Boston Scientific Corp. in Watertown, Mass.

“This company does not have a formal strategy to promote IT as such, and I'm not working on putting one in place. Those managers that have an interest or a background in IT tend to drive the education or advancement on their own. However, I will help as needed by advising,

suggesting appropriate classes and coming up with a list of reading material.

“As in many small to mid-sized companies, the MIS department here just doesn't take the time to come up with a formal training plan. Most of the training that managers participate in is external, with a vendor or distributor (as in the case of the engineering department, which uses AutoCAD), or at a university in a class geared toward a specific application. Occasionally we have on-site training with Lotus, WordPerfect and Harvard Graphics, but again this is done when requested or needed by the end users.

“In my professional experience, managers will pursue training and education based on their interest. We're going through an age where most managers don't have an IT background, and it's difficult to push IT onto them. But as people come out of college and move up, they will have the background and they will be comfortable using everything from networking to PCs to mainframes.”

Readers are invited to suggest Conference Call questions. Contact Senior Writer Meghan O'Leary at 800 343-4935, ext. 4733, or by fax at 508 872-0618.

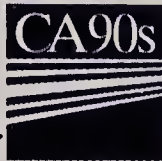


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